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The Influence of the Gulf Stream upon the Summer Climate of the Atlantic Coast of the United States. Read before the Montreal meeting of the American Association for the Advancement of Science. By JAMES WYNNE, M.D.

The object of this paper is strictly hygienic. There are few medical men, engaged in any considerable practice, who have not under their charge patients whose diseases require a change of climate, as one of the most efficient modes of relief; and it not unfrequently happens that the proper selection of a residence is a matter of such importance, as to constitute the entire difference between a favorable and an unfavorable termination of the disease. Any light, therefore, thrown upon this subject, which will enable the medical man to indicate the choice of a selection with greater confidence, as to the absolute condition of the climate, will, I am convinced, be kindly received by those members of the Association who are connected with this profession, and may not be unwelcome to those who are engaged in other pursuits.

The recent examinations conducted by the officers under the direction of the Superintendent of the Coast Survey, have shown that the bottom of the Atlantic Ocean presents a range of mountains, pursuing a similar course to the Apalachian chain, some distance back from the coast. These examinations have not yet been completed, but so far as they have been prosecuted, they clearly demonstrate the continuity of this chain of submarine mountains, and its general course. The effect of this configuration of the bottom of the

ocean over the temperature of the water, is clear and unequivocal. The whole extent of this influence has not yet been determined, but thus far it shows that the Gulf Stream is not one uniform mass of warm water, pursuing a northeasterly course along the coast, at a pretty uniform distance from it, but a series of bands of warm water, interspersed with colder ones. These have been laid down by Prof. Bache, with admirable precision, in his map delineating the distribution of the temperature of the Gulf Stream. An underlying Polar current of cold water, even in the more southerly explorations, is likewise clearly established.

The position of this mountain chain, in affecting the temperature of the air along the coast, as well as the water overlaying it, has been as clearly demonstrated. Lieut. Maury, in his pilot-chart of the North Atlantic, has recorded the direction of the wind, for each month in the year, with great accuracy. The information contained in his chart is taken from the most authoritative sources, and, in some instances, extends back as far as 1810. This chart subdivides the ocean into squares, of five degrees each of latitude and longitude, and the monthly observations, within each subdivision, are made to extend over this surface. For the purpose of the present inquiry, subdivisions of a single degree would have afforded greater definiteness, but the facts deduced from the chart, as it is, are of the highest value. As our inquiry is confined to the summer months, when invalids in search of health, or those who are well, in pursuit of a more temperate air than is to be found in the cities, or even in rural districts, visit the sea-shore, the deductions from the chart will be confined to the months of June, July, and August, and to that portion of the Atlantic stretching along the sea-coast.

In the subdivisions between latitude 30° and 35° and longitude 70° and 75°, embracing the sea-coast from St. Augustine, in Florida, to Cape Hatteras, in North Carolina, there were made ninety-nine observations of winds, in the month of June ; of these forty-one, or nearly one-half, were from the south and southwest. In July eighty-four winds were noticed, of which fifty-two came from the south and southwest ; in August, one hundred and thirty-eight, of which sixty came from the south and west.

In the subdivision embracing latitude 35° to 40° and longitude 70° to 75°, extending from Cape Hatteras to Cold Spring, N. J., three hundred and fifty winds were observed in the month of June, of which one hundred and forty-three were from the south and southwest ; in July, three hundred and ten, of which one hundred and

sixteen came from the south and southwest; and in August, three hundred and sixty-six, of which one hundred and twenty-three were from the south and southwest.

In the subdivision between latitude 40° and 45° and longitude 70° and 75°, embracing Long Island Sound and the southern expanse of the New England coast, in June two hundred and thirty-one winds were noted, of which one hundred and eight came from the south and southwest; in July, three hundred and eight, of which one hundred and sixty were from the south and southwest; and in August, one hundred and eighty-three, of which sixty were from the south and southwest.

These are the facts. The deductions from them are important. It appears, from these observations, that of the prevailing winds in the summer months, never less than one-third, and, in many instances, one-half, come from the south and southwest. It must be remarked that the winds noted were sailing winds, with some degree of force, and not the slight, ruffling breeze which, although insufficient for the purpose of rapid sailing, is yet most grateful in its effect upon the health and comfort of those so circumstanced as to come within its range. The usual direction of this lighter breeze on the Atlantic, in the summer months, is from the south and southwest, directly over the current of warm water composing the Gulf Stream. The winds from this quarter are, for the most part, gentle, balmy, exhilarating, and peculiarly happy in their influence upon the human body; those from the north and east, on the contrary, are violent, raw, and depressing; while the former should be courted by the invalid, the latter should be as sedulously avoided.

It by no means follows that the wind on shore is the same as that upon the ocean. A very slight obstruction, as an intervening range of hills, or indentation of the coast, may leave any particular situation in calm, or subject to the influence of a less grateful wind, while the whole surface of the water is swept by a delightful air from the south or southwest. An example of this may be given in the Highlands of Navesink, situated a short distance from New York, and immediately behind the light-house on Sandy Hook point. These Highlands, whose sides are covered to the water's edge by a rich growth of vegetation, and are highly picturesque in their effect, are shut off from the southwesterly ocean winds by a small promontory, the effect of which is to render the air in the sheltered localities calm and oppressive, while the sandy point directly in front, and scarcely more than a stone's throw distant, is agitated

by a balmy and refreshing breeze. Sachem's Head, and the contiguous town of Guilford, furnishes another illustration of this fact. The promontory termed Sachem's Head, which juts far out into Long Island Sound, is visited almost daily in the summer by the southwest trade wind, which begins about ten in the morning and continues pretty regularly during the day, unless intercepted by some more violent wind. It not unfrequently happens that while this balmy ocean breeze is playing over this promontory and reducing the temperature below 80°, the town of Guilford, but a few miles inland, is subject to a land breeze, and exhibits a range of temperature between 90° and 95°.

The traveller over the New York and New Haven and New London Railroads, which pursue an easterly course along the Long Island Sound, cannot fail to remark the perceptible difference almost always observed in the temperature after leaving New Haven for the east. However exalted the temperature may have been, or oppressive the condition of the atmosphere between New York and New Haven, he is almost certain to be met by a delightful ocean air from the southwest, a few miles east of New Haven, which accompanies him on his passage to New London. This is due to the configuration of Long Island.

Near New York, the northern shore of Long Island rises into elevations of greater or less extent, but sufficiently so, at most places, to intercept the sweep of wind from the ocean on its southern border. These elevations gradually diminish in an easterly direction, until a point is reached a few miles east of New Haven, where the whole island becomes flat and sandy, and but a few miles in width. This low plateau offers but slight interruption to the progress of the southerly ocean winds, and allows them to play over the surface of the water in the Sound itself, and fan the opposite New England coast.

The islands off the coast of South Carolina, as well as the coast of North Carolina, Virginia, and New Jersey, have a greater or less south and southwestern exposure. Within these limits are found Old Point Comfort, Cape May, and Long Branch, which have great celebrity as sea-side places, and attract large numbers of visitors. Each of these places is subject, however, to the depressing effects of the northeasterly gales; the more southerly points are less affected from this cause than the more northern.

The whole stretch of Long Island on its southern side—which is at present, with but few exceptions, little better than an inhospitable sand bar, drifted up from the waves of the ocean—that portion

of the Connecticut coast to which I have alluded east of New Haven, as well as Rhode Island and a part of Massachusetts, enjoy in the highest degree the advantage of exposure to the south and southwest, and are at the same time best protected from the winds from the northeast. Newport, with many disadvantages, not the least of which is the compactness of its houses and their almost total exclusion in the old part of the town from a sea view, enjoys a world-wide reputation as a sea-side residence, for which it is wholly indebted to the salubrity of its air, derived from its sheltered position from the northeast winds on the one side and its free exposure to the southern trade wind upon the other.

It is not the purpose of this paper, however, so much to point out individual localities, as the general principles upon which the sea side climate of the Atlantic coast may be determined, a knowledge of which will enable the practitioner or intelligent traveller to select that locality best adapted to the particular case. As a climate for invalids that is most desirable which furnishes the greatest protection from the depressing northeast winds, and the fullest exposure to those which come heavily laden with health-restoring qualities from the balmy southern ocean, borne along the current of the Gulf Stream. Many sheltered positions may doubtless be found upon the coast south of Long Island, uniting many if not all of the advantages already pointed out, which it is earnestly to be hoped will be discovered and improved. The advantage of sea-side resorts in such positions as to render them available for those whose occupations or means do not permit them to take long journeys, cannot be too highly estimated.

On Rheumatism of the Epithelial and Non-Epithelial Fibrous Tissues: Its Sequence to Scarlatina and other Exanthemata. On Rheumatic Gout, Chorea, &c., &c. By H. P. DeWees, M.D., New York.

(Concluded from page 281.)

The secondary abscesses following rheumatism, result in most cases, from local phlebitis, or from the detention of minute fibrinous plugs arresting the circulation in the small vessels. Sometimes, the breaking down of larger plugs with interior pus, causes irritation to be established, with more or less serous infiltration into the adjacent cellular tissue, the abscess varying according to the local arrest. The limits of this paper, however, will not allow more than mention of these conditions. I will merely refer to the pathological facts of

the vessels becoming inflamed, and subsequently thickened or plugged up, so that more or less perfect closure ensues, with resolution into abscess, or into mortification, either local, or at a distal point, if the large vessels are arrested in their circulation. The nature of the gangrene, whether moist or dry, will in great measure depend on the perfection of the closure. Sometimes, however, the surrounding parts become so agglutinated by the adhesive action of repair, as to render the neighboring tissues anatomically unrecognizable, and totally unfit for their purposes of secretion or of motion. If such deposits take place in the lungs, the damage is the same, and in this way vomicæ may arise, perfectly independent of tubercular origin, a plug of fibrin not as large as the head of a pin arresting the local circulation, with consecutive destructive changes; so that rheumatism, by its results, may become the parent of evils, equal, in their destructive tendencies over life, to tubercle in its highest state of development and disintegration. If the vessels of the brain become the seat of arrest, its nutrition will be more or less interfered with, and local atrophy or softening may ensue, with lesions of motion, or of intelligence, as resultants. And thus paralysis and imbecility may follow in the train of that so-called "simple rheumatism."

The cases of paralysis after rheumatism of the spinal investments are not unfrequent. On dissection, this apparently high inflammatory action, so complete in its functional arrest as even to eventuate in death, cannot at times be recognized by the eye, as regards structural change. And the same can be said of it when seated in the serous membranes of the brain; the so-called inflammation being a speific poisoning of the very centres of life, leaving neither trace nor residue.

In the gouty the blood poison is not always exhibited by the "big toe" attack, with increasing demand for flannel. The skin may become the beacon of its approach. Lichenous, herpetic, or other eruptions, painful to bear and obstinate to treat, may not only mask the attack, but for a long time keep it in "masterly inactivity." And the same, at times, may be said of the poison of rheumatism.

It would appear, from reasoning on the facts adduced in the study of rheumatism and gout, that if the lactic acid formations are in excess, either by over-generation or by non-elimination, that an attack of acute rheumatism is apt to follow, and especially after the sudden drying up of these eruptions. If this does not take place, but the skin disorder recedes slowly, and there is apparently but a small excess of lactic acid retained, the rheumatic pains are irregular, flying from spot to spot, or the joints become more or less stiff, not

from any difficulty in their opposing surfaces, but from muscular inability to apply the necessary force towards movement. If, on the other hand, the uric acid is not expelled, or is generated in excess, gout is the frequent successor. At this moment I have two cases that would apparently verify these views.

The white fibrous tissue is the chief texture affected in simple acute or true fibrous rheumatism, either as it occurs in the formation of the ligaments connected with joints, or in the membranous form covering tendons, or in the aponeurotic expansions of the large muscles, as the fascia lata of the thigh, with its deep prolongations, or in the cranial dura mater, sclerotica, &c.

It will be necessary to bear in mind that the sheaths of tendons—the bursæ (sometimes called the bursal synovial membranes) between the tendons of muscles, between tendons and bones, and between the projecting parts of bones and skin, as the olecranon, &c., *have no epithelium*,—although in function they resemble the true synovial membranes, yet they differ from them anatomically and in exact analysis. But this is not the case in the *bursæ communicating with the synovial capsules; these, as well as the articular cartilages, have an epithelial layer.* These anatomical peculiarities are to be remembered, as they form the distinctive features in the pathology, diagnosis, and treatment.

Although the synovial membranes are not so prone to the effusion of plastic lymph, as are the serous, yet the bursæ are at times found not only traversed by adhesive bands, but even completely obliterated. The movements in such conditions are greatly impeded, but not so completely, as when the sheaths of the tendons are in a like manner affected, the free play of the attached muscles being rendered more or less impossible.

The fact is not to be lost sight of, that a large proportion of the urea is derived from the disintegration of the body tissues, especially of the gelatinous and albuminous orders, independently of the introduction of nitrogenized food into the system. It is chiefly, or at least frequently, in rheumatic disorders which are the offspring of deranged secondary assimilation, that urea forms so fatal an agency, although nervous depressions and coma arise in non-rheumatic diseases; as those of the kidney, or from puerperal causes, &c. Indeed, in many diseases involving the serous membranes with kidney difficulty, urea forms a dread element, whilst, by its non-elimination, or selective error, it lies at the secret cause of disturbance, not only in the sclerotic membranes, but also in many of the diseases of the aqueous and vitreous humors of the eye. This is now only alluded to, and may form the subject of another paper, or will serve to call

notice from other medical observers. Not less important would be a series of observations as regards the action of oxygenated remedies in a high lithic condition of the system, as the uric acid might thus be converted into urea. In the gouty this change of uric acid into urea might take place by the action of oxygenated remedies, and suppuration of the synovial capsules and serous membranes ensue, as in rheumatism, whilst arachnitis and coma form the modes of death, especially if kidney disorder exist at the same time. In other cases—those in which death is sudden, and the organic lesions are inappreciable or insufficient to account for the fatal termination—the urea, by a rearrangement of its elements, may be converted into cyanate of ammonia, thus poisoning the centres essential to life.

It is not always that in rheumatism there is a *deficiency* of surface excretion, nor in gout that the kidneys are chiefly in fault. The *materies morbi* may be generated by the imperfect composition and quantity of the blood itself, so that the *tissues of selection* cannot be properly nourished,—their structural assimilation being more or less destroyed.

The excretion of soda in tophaceous deposits or articular incrustations, does not take place in rheumatism as in gout; it is, however, partially witnessed in the hybrid affection, viz: rheumatic gout. This in part, may be accounted for; as in the gouty the primary digestion is disturbed, whilst in the rheumatic the secondary assimilations are more at fault. Hence, the first are apt to use soda as a corrective of acidity, or "to bring the wind off the stomach;" whilst, probably, from the inactivity of the liver, the alkali from the salt used at table is not called on in the formation of bile, and thus collects in the blood. In rheumatism, however, we have at times such fusion of the immediate tissues about the joints, rendering anatomical division almost impossible, that it would seem by the excessive attraction of lactic acid to the parts, it possessed the power to act as a solvent of the elementary fibres, as I have found it for many years useful for that purpose in dyspepsia of animal substances.

It is well known that rheumatism more frequently attacks the weakly, the intemperate, the irregular in diet (and especially if of unwholesome nature), those who may be exposed to vicissitudes of temperature, or who long labor mentally or physically with insufficient food, or under anxiety and mental depression. But the strong, well-fed and ablebodied, young or old, are liable to its sufferings; in these, if the exanthemata, or accident, have not engrafted a kidney vice, and the blood is not overloaded with nitrogenized products, the attack will be of the simple inflammatory type, affecting the non-

epithelial fibrous structures or surfaces; whilst heart disease, and especially of the mitral valve, will be infrequent. On the other hand, if kidney disease, accidental or exanthematous, be present, then structures more important in their uses and anatomical arrangements, viz: the interior capsular parts, the heart and the arachnoid serous membrane, &c., are liable to become affected, whilst the prognosis is against the patient, either immediately or remotely. Delirium or coma, more or less profound, is the distinguishing feature in these cases. In the others, where the exterior cranial fibrous dura mater is attacked, although the sufferings are intense and the venous suffusion alarming, yet the chances to the patient are more favorable, and delirium and coma do not follow in so fatal a train if present, unless the effusion be great; and even here, the disturbances are more of position than of nutritive function.

The rich or the pampered are not, however, the sole proprietors of the gout; the poor, the half-starved have also their gout; it is the offspring of their very poverty. Dives, introduces into his blood from without the great sources of his evil; whilst Lazarus produces a condition almost similar, by the rapid disintegration of his own tissues, loading his ill-fed blood with uric acid and other compounds, from the wear and tear of his system. There is no compensation by proper supply of food; and the kidneys and other emunctory organs are too enfeebled, though, perhaps, not diseased, to extract the uric acid or urea from the blood. These cases, though rare, yet take place—it is the gout of the impoverished. They are, in general, inebriate from necessity and from physiological instinct; their systems cry aloud for carbon,—for liquor,—that the oxygen of the air they breathe shall not burn up their pittance-saved bodies, but attack the free carbon and hydrogen of the alcohol, and leave in respite their meagre frames. It is the gout of demand and not of supply. And here we find a vivid example of the fact above stated, that the tissues suffer disintegration, or death, not only from deficiency of nutritive supply, but from defective quality of the blood. In the gout of the impoverished, nitrogenized food—the bane of the rich man—and those remedies having the power to retard the decomposition of of tissue, as tea, coffee, hop, &c., must be trusted in; and thus the waste of the system being restrained, the blood will not be surcharged from the structures themselves, and the local disintegration will be arrested, and the organs return to their uses; but mostly with deformity as an index of their past trials.

The urinary deposits, both in gout and rheumatism, sometimes

mask the condition of urine as secreted by the kidney—the uric acid formations being disguised by the alkaline, or earthy phosphates. This is chiefly owing to chronic vesical irritation or inflammation, the muco-pus acting on the urea, and converting it into carbonate of ammonia, which precipitates the alkaline salts. It is thus that the condition of the urine may be masked by the presence of pus, or of a mucoid body, in its route from the kidneys. Indeed, the highly acid state of the secretion may be the very cause by which the bladder may be irritated. The prognosis in these cases depends on the nature of the bladder or kidney irritation, the possibility of calculus formation, the recent or long previous existence of the affection, &c.

The space allotted me is nearly exhausted, and will necessarily oblige me to condense the chief features of treatment, with a running statement on some other points. From the preceding views the treatment almost explains itself. In the acute rheumatism of the robust, at whatever age, the seat of attack is in the white fibrous tissues, the fever high, attended generally with great sweating, the pain and swelling intense, but *greater than when the epithelial fibro-serous tissues are affected.* Venesection is rarely called for, though by some regarded as not only a mitigator of pain, but as instituting a better condition for subsequent remedial action. As a lessener of fibrin it is useless—its chief value, if used, being the relief to the vascular tension, and the rather more rapid absorption of neutralizing remedies. In my own practice I have not used it for many years. The local applications of leeches is warrantable, but more troublesome in general than the affection. A light antimonial emetic, however, answers more fully the desired end, followed, on the subsidence of its action, by an active purgative of Hyd. chlor. mit., with Ext. Colocynth Comp. The advantage of early emptying the bowels is realized, when the increasing disablement of the joints renders the efforts to rise not only agonizing but injurious. The affected parts should be bathed with a warm mixture of Potassa-bi-Carb. and laudanum, and afterwards wrapped up in cloths saturated with the solution, and covered with oil-silk or rubber, which can be gradually removed if the heat is complained of. Potato water, as left after boiling the vegetable or its parings, has proved a most soothing application, when freely sponged quite warm over the swollen and painful joints, which can afterwards be wrapped up in it, as directed for the alkaline wash. The Tinct. Actea Racemosa, in 6 to 12 drop doses, can be given in or followed by a solution of Nitrate, Bi-Carbonate, or Acetate of Potash; or the Tart. of Potash and

Soda, if preferred, can be substituted. Frequently, in children, the Actea alone serves to cut short the attack after a few doses, in conjunction with alkaline fomentations. The necessity for purging generally ceases after the bowels have been well moved in the beginning. At all events, *intestinal irritation is to be avoided.* It is well to remember that the expectant treatment of acute rheumatism is nearly as favorable in its results as the active. Colchicum, in the acute attack of the strong, who have deranged hepatic action, combined with opium, after due operation from the bowels, also forms a valuable remedy. Its purging and emetic effect is unnecessary and to be avoided. It is more as a cholagogue and an excretor of lithic acid, than as a specific in rheumatism. Where the liver is already acting freely, it does not form an agent of trust, and when frequently employed serves to injure the system. Hence the discrepancy as to its value. In alkaline combination it is frequently useful. The Nitrate of Potash, so much lauded of late, will be found beneficial where a high condition of fibrin exists in the blood, its solvent action over that element being called for. Otherwise it is no more, and many times not so valuable a remedy as the other alkaline salts. It is, therefore, not from any specific eliminating power of the rheumatic poison that is called for, but from its defibrinating action, and its value as a diuretic, and its probably converting the lithic acid into a more soluble compound, urea. After proper evacuation, the Pulv-Doveri, in full doses, will generally, though not always, produce refreshing sleep and quiet the pain. If found stimulant to the brain, watchfulness or flightiness taking place, it either must be increased or left off. Opium acts, in many cases, as an expeller of the lithic acid—in chronic cases, conjoined with turpentine, it sometimes causes immense quantities to be evacuated.

All things considered, time, forms as valuable an element in the treatment as the remedies selected. A certain amount of *materies morbi*, and the disposition to its reproduction, has to be broken up, and time, sweating, and sometimes urination are at work in the process of elimination. Remedies may assist, but if injudiciously employed they will retard, the patient suffering from both disease and doctor. The diet should be unstimulating, meat, soups, and jellies avoided, toast and water, with light gruels, being the best regulators. As the attack subsides, vegetable diet should be adhered to,—the local applications and internal remedies can be moderated. Clam soup, and raw salt oysters may, after a time, be allowed ; and now, if the blood shows decrease of its red corpuscles, the mild preparations of

iron may be cautiously commenced on. If loss of flesh be increasing, coffee and tea will prove beneficial as preventers of tissue waste. In the anasarca of the debilitated, squill with quinine will be found most serviceable.

By these means the immediate reättack may be warded off, but mental quiet and bodily rest are imperative. The supply being small, the demand should be lessened. But the low diet system is not to be carried too far; it is well to remember that the fibrin is increased in the blood by starvation, as well as by high feeding. Rest, however, is absolutely necessary. No blood is to be thrown into the parts in and about the joints, by the invitation of exercise. Even in the very robust, acute rheumatism sometimes attacks the joints after long-continued and violent exercise. But where the parts have been affected, with the system lowered by diet, remedies, and wear and tear from pain and loss of rest, great caution as to exercise is requisite; as other structures, and of higher importance, may become involved, and simple acute fibrous rheumatism, be merged into an attack of the epithelial bursal and synovial membranes of the interior of the joint, besides endangering the heart, pleura, and other organs, when their liability to become engaged was not at first probable.

It is this small point which makes the utmost watchfulness necessary, as regards keeping the system in good general working order, and which has made the pathological statements so variable, as respects the engagement of the heart in acute rheumatism. Every practitioner has observed that, when in the first attack in sound persons, the swelling, heat, redness, and pain have been very great, the heart is not so liable to become affected, as when all the symptoms are more moderate. In some cases, however, both the tissues in and without the joint are attacked, and then the diagnosis is to be carefully viewed, as the renal disturbance is mostly present, though perhaps latent to observation, at the time.

The friction with liniments, whilst the thickening, &c., remains, after the subsidence of the acute pain, will be found beneficial. The following recipe I am in the habit of using:—

R.	Ol. Origan, - - -	ʒi
	Ol. Lavend. Spicat., - -	ʒss
	Tinct. Aconite Sat., - -	ʒi
	Ol. Amyg. dulc., - - -	ʒiii
	Aq. Ammon. fort., - -	ʒii
	Vel., - - - -	ʒss

M.

A light covering, with cotton batting and oil-silk, should be

applied, unless the heat is complained of. The gradual reduction of the envelopes should take place after a time, so that chilliness be avoided, which would attend its speedy withdrawal.

The treatment in chronic fibrous rheumatism has the same features, differing more in degree than method, excepting in the employment of iodide of potassium in small doses. The system is to be carefully watched, exercise is to be judiciously and regularly taken, the surface made to excrete properly, the bowels to be kept soluble but unirritated, sleep should be rather longer than in health, as a promoter of insensible transpiration and nervous recuperation, whilst stimulant embrocations, oil-silk sweatings, and light galvanic applications should be employed to the part. The color, quantity, and specific gravity of the urine should be watched, as giving evidence of approaching danger, or of increasing constitutional vigor.

In the heart complications in rheumatism, the treatment requires great circumspection. The difficulty of breathing, the præcordial pain, the out-of-breath manner of speech, the desire to be propped up, the increasing effusions into the legs, scrotum, chest, or abdomen, with diminished urine and rapid pulse—these point out the imminent peril of the sufferer, from which nothing but a strong constitution, and skilful treatment can save him. The drain on the pent-up fluids is to be made through the bowels, as the kidneys are generally too occluded, or broken down in functional power, to be of any use. The Pulv. Jalapæ Comp. with Elaterium, or other hydragogues, with digitalis over the heart, or internally 3 to 6 drops of the Tinct. Veratrum Viride must be administered, and watched during their operation. Support by brandy or champagne must be proportioned to the exhaustion or nervous necessity, but no more. The stimulus, and not the carbon, is wanted now—neither lung nor liver can dispose of it. If alcoholic drinks disagree, coffee and camphor can be substituted, sometimes with most excellent results. During purging, the *position of the patient is to be kept unchanged*, or *even with the head lower if possible*—at all events, he is not to be raised suddenly—whilst stimulants should be snuffed through the nostrils, &c. If these means are successful in reducing the effusions, the kidneys can now be gently invited into action. The palpitation sometimes yields, most gratefully to the patient, after the administration of champagne, the carbonic acid serving to allay the irritability of the heart's action. By conjoining the infusion of the wild-cherry bark—or, where its bitter tonic property seems to disagree with the stomach, a few drops of the dilute Hydrocyanic Acid,—a most happy effect may

sometimes be obtained, when the irritability is excessive. But great caution is requisite in the administration of organic sedatives, as will be mentioned further on.

In the convalescence, if *the liver still should continue at fault*, the preparations of iron are to be avoided, as they will serve to induce congestion, and lock up the proper secretions of the organ. At this period, however, the kidneys will sometimes resume their functions, and labor not only for themselves, but, by taking off the purpurates and other highly carbonaceous compounds, so relieve the liver, that the system daily rises refreshed from their effects. The urine becomes more and more abundant, and loaded with the urates of ammonia and soda. It is here I would particularly caution the young practitioner, in his testing the urine with nitric, or nitro-muriatic acid, lest he should mistake the very copious deposits of the white crystals of lithic acid, for albumen. This I have seen done more than once. The deposit of the phosphates by heat, is corrected from wrong interpretation on the addition of the acid, which re-dissolves them. This dense condition of the urine by the urates of ammonia and soda, is the very salvation of the patient. Beware then of administering any acid, either alone or in combination with a vegetable or mineral tonic, as it will serve to neutralize just so much ammonia and soda, and thus prevent the elimination by the kidneys of the very lithic acid so poisonous in its action to the general system, but especially to the serous membrane of the chest, and of the heart, which will be again tortured by the acrid blood into renewal of its exhausting efforts, whilst convulsion and coma stand threateningly near.

In the early part of this tumult of the system, when the organic force is consuming by the overtask of the functions, I would strenuously caution against the abuse of opium, or of any narcotic, to produce sleep or relieve from pain. And I will only reiterate a maxim which I have before published, and often repeated, viz: that in all organic diseases attended with pain and excretory impediment, opium and other organic sedatives are to be avoided, as, by paralyzing the organic centres, dropsies may collect in the cavities.

Lemon-juice, in some cases of acute and chronic rheumatism, is at times beneficial, though rarely to be trusted to alone. Yet I have seen cases where it seemed to act as a perfect specific. It will prove chiefly beneficial in uncomplicated cases, where the urea fails in its urinary quantity, and where *an excess of ammonia* exists in the blood. Benzoic acid, in these conditions of chronic rheumatism, acts at times most favorably.

The children of gouty, rheumatic, and dyspeptic parents, are prone to a lithic condition of the blood, or at least to its elimination by the kidney. It is early marked in them by incontinence of urine, or "wetting the bed." Although the heart does not evidence organic disease in them, yet its motions are violent and frequent whilst crystalline lithic acid is formed in the urine; or they are variable in their diet and irritable in their dispositions, the urine being pale, abundant, but free from lithic acid deposit or in solution. The acid condition of the blood is irritating to the internal membrane of the heart, and the contractions are sharp and frequent. There is a loss of true tone in the system, and rheumatism is apt to set in spontaneously, or after violent anger or any undue exhaustion, exercise, or exposure. Here, opium forms a most valuable remedy from its sedative influence and its power to disengage the lithic acid from the blood.

Children given to masturbation, but whose urine alternates from lithic to the phosphatic, the intermediate depositions of the urates of soda and ammonia taking place, with increase of urea, are also subject to rheumatic attack or pains. Substantial diet, with opium at night, is the chief remedy. The furtive look, the desire for solitude, the uncalled-for sighing, the vesical irritability, the irregular languor, and the blowing sound in the heart and large vessels, with more or less palpitation, will serve to direct suspicion to the solitary acts of the patient, which careful watching may verify. Organic changes may, and frequently do, establish themselves from these long-continued functional disturbances. But it is always well to remember, in the disorders of nutrition of the heart, that the young are reproducers—their organic desire to remodel is ever at work; that the hypertrophy, if it exist, is mostly from *interstitial* deposit, and not a true fibrillar increase of the heart itself. Restraint from the abuse, chemical changes afforded to the blood, and the supply of fresh material by proper food, with attention to moderation of exercise, and sometimes to complete bodily rest, will form not only the treatment, but, in many, a *new organ*. Of this I have seen several most excellent examples. In later life, an individual ceases to be an active remodeler; he is on the waste account; his capital has no interest accruing, and he is forced to use it up for the common necessities of his system. These are distinctions as well as differences. Had these views been more common, so many heart-disturbed children would not have filled an early grave, or been moored to the stake of life, to waste away an aimless existence in later years.

In scarlatinal rheumatism, all treatment at times is rendered impossible by the condition of the patient; as in scarlatina, the do nothing system is frequently the best. Good nursing, attention to the skin by sponging or moist wrappings, are better than the "nimia diligentia medici." During the fever, the pain is mostly in the wrists, or in one or two joints. The scarlatina and the rheumatic complication are offspring of the same poison. There is pain, as in true fibrous rheumatism, but it is seated in different structures, and attended with different implications as regards the head, the heart, and the chest. In the robust, the diet, or rather the absence of it, forms the treatment. All animal food is to be avoided—the blood is yet too overloaded with nitrogenized products. If too early indulged in, the articular pains recommence or increase, chest or heart difficulties are renewed, and convulsions endanger the life of the patient. Farinaceous and vegetable diet must be continued a while longer. The debility is deceptive; it is more the result of the oppressive action of urea over the great nervous centres, than loss of power from nutritive want. The return, then, to animal food, must be cautiously watched.

But in the weakly, these fears have to be in a measure given up. At the first ingress of the rheumatism, a little abstinence may be enjoined; but after that, the position is different. Death by debility would ensue more rapidly than by the disease. It is the rheumatism of demand. Food and stimulus must be given. Ulcerations —pus makings, about and in the joints, are to be checked; food and drink must do it; for specific medicines are useless, unless quinine, iron and other tonics can be so called. Under a lowering plan, the coffin is sure to close over the wretched victims; and life, to most of us, is better with a stiff leg or disabled joint, than the kind attentions of an undertaker.

In the convulsions attending both cases as above stated, the directions should be:—for the robust, feet and legs in hot water, with head up, or at an easy reclining angle; for the debilitated, the *horizontal posture*, and no *warm bath*, but cold water sprinkled on the face and chest, in the *order of natural respiration*. Here, the brain must have blood, though diseased blood it be. From the neglect of this simple precaution, I have seen a child killed as though struck on the head,—the feet, and not the brain, being supplied with blood!

In syphilitic, and also in chronic rheumatism, iodide of potassium acts more than well; in the former it is almost specific. Its combination with colchicum and with opium, may at times be required.

It is not only diuretic, but possesses the property to reëstablish assimilative vigor. Small doses, in repetition, act more favorably than large doses at longer intervals.

In rheumatic gout, especially where the fibrous sheaths of nerves are attacked, the combination of Hyd. Pot. with Colchicum acts most favorably, the Tinct. Aconite Sat., with Acid Hydrocyan. being painted freely over the route of the affected nerves, and kept from evaporating by strips of oil-silk or rubber. In the cranial effusions, the Hyd. Potass is the most reliable remedy.

Calomel is chiefly useful as a defibrinator, as a promoter of interstitial absorption, and as a specific stimulant to the liver, by which the decarbonation of the blood shall be promoted through the secretion of bile. In the debilitated it is positively harmful, if continued; although the balance at times, even in them, may be in favor of its use, where the brain is oppressed by black blood.

Guaiacum has long enjoyed a reputation in chronic rheumatism, and with apparent good right. It seems to possess the power of increasing the excretion of both lithic and lactic acid, by the kidney and skin. In rheumatic dysmenorrhœa, in leucorrhœal discharges attending this disorder—in the dermalgia, so painful on pressure or warmth—in hysteria and hysteric knee-joint complaints, mostly of a rheumatic nature, &c., this remedy, in conjunction with others, or in the form of the Vol. Tincture, will be found serviceable. The cases, however, are to be selected properly, whilst *time* forms an element in its action. I have known it not only cure, but eradicate some of these disorders.

Rheumatic chorea has already been adverted to, with partial mention of remedies. The irritability of the heart, or the nervous propagation is, in many cases, to be quelled before any permanent success can be attained. Arsenic, as in Fowler's solution, in six drop doses, with the endermic application of morphine, and quinine (if after malarial influence) over the cervical spine, is at times very valuable. In the rheumatic form, colchicum and actea racemosa, in small doses, have been found useful. The same rheumatic condition of the system have been attended, in both male and female, with globus hystericus. Stammering, as before remarked, is sometimes the result of rheumatism, in children whose systems have been weakened, and who are thus more liable to mental emotions, as fright, &c. The heart palpitates readily, and the muscular nervous branches to the larynx, and more rarely the hypo-glossal, or motor of the tongue, become the channels of the disordered reflex action. I have many times noticed

the sudden hesitancy of speech, from sudden emotion, in the rheumatic, differing from the arrest of power in the organs from emotional acts in the unaffected.

In conclusion, I shall only refer to acupuncture in sciatica, with effusion into the sheath, and in muscular pains, having been at times serviceable. Chloroform, blisters, the hot button, the endermic applications of veratrine, morphine, delphine, aconitine, strychnine, and other alkaloids, have had reputation for a time, but chiefly in neuralgic affections. In the gouty and rheumatic, local applications may relieve temporarily, but it is only by the patient study of the blood changes, with the appropriate antagonistic remedies, and food, that any permanent benefit can be realized, or security against attack be obtained.

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Hippophagia. The Employment of Horse-flesh for Alimentary Purposes. Translated from the French of Dr. FIGUIER, for the MONTHLY.

The alimentary use of horse-flesh constitutes a question which has elicited much discussion during the year 1856. In view of the scarcity, and especially the present high price of provisions, economists, tradesmen, and men of science have discussed the possibility of introducing this new article for public alimentation. We propose to take a glance at the principal publications and researches which have thus far appeared on this important subject. After an exhibit of the facts, we will present the practical conclusions which are deducible from them.

Almost all the auxiliary animals are suitable for food, as can be easily explained. By increasing the animals which are destined for his aid, man acquires a great amount of force, as well as a large quantity of alimentary material; and he is induced to avail himself of the latter, when the former becomes defective or useless. Why, then, is the horse—an animal of large stature, and one of the most important of the auxiliary animals—not employed, or, to speak more exactly, *no longer* employed for alimentary purposes?

In our age, some few countries being excepted, nothing is required of the horse, in exchange for his food, except his strength. When old age comes on, or accident injures, so that his services are lessened, or rendered impossible, the horse is considered as capital which is on the eve of total loss; only a few portions of the body are made

useful. And yet his flesh would offer valuable resources towards alimentation, if strongly-rooted prejudice did not discredit it in public opinion, by attributing inconveniences to it, from which it is, in reality, exempt. Buffon, himself, did not hesitate to condemn it as one of the worst kinds of food ; but the celebrated naturalist, without doubt, was led to this conclusion by public opinion, and only spoke from hearsay, as it is but little probable that even a morsel of horse ever figured in the list of dishes on the table of the Lord of Montbard.

It is estimated that there are not less than *two millions* of horses in France. But a small portion (the hair, skin, tendons, and bones,) is made of practical value. If the remainder is ever used for food, it is only in small quantity, and always as a fraud. To what slight uses, then, is the slaughtered horse devoted in France, while *millions* of men are living overwhelmed with distress, who vegetate, as it were, deprived of meat, and even of bread, and whose only nutrition is potatoes or chestnuts !

Like the ox and the sheep, the horse is essentially herbivorous ; no hurtful element is elaborated in his economy. His blood is richly nitrogenized, and is free from all unwholesomeness. Besides this, his blood is far from being disagreeable in taste. The proofs of these good qualities are very numerous ; let us cite some of them :

Baron de Tott relates, in his Memoirs, that having been admitted, as Envoy of the King of France, to the table of Krim-Gueray, the Khan of Tartary, some excellent ribs of smoked horse were served up, and received the praises of all.

The first of modern hygienists, Parent-Duchatelet, informs us that large quantities of horse-flesh, in times past, have been admitted into Paris, under different pretexts, but destined for food.

Huzard, Sen'r, a skilful veterinary surgeon of the latter part of the eighteenth century, states that at the time of the famine which raged during the Revolution, the greater part of the meat consumed in Paris, for six months, was furnished from slaughtered horses, and no inconvenience to the public health resulted from its use.

Larrey, the surgeon, in the campaigns of the Rhine, Catalonia, and the Maritime Alps, had recourse, frequently, to this aliment for his wounded. He made the most advantageous use of it at the siege of Alexandria, in Egypt, and owed to it, in a great measure, the recovery of the sick. Let us hear the words of the illustrious military surgeon :

"Experience," says Larrey, "demonstrates that the use of hors -

flesh is very suitable for the nourishment of man. It seems to be particularly nutritious. Its taste is also agreeable. I have often employed it with the greatest success for the soldiers and the wounded of our army. During the siege of Alexandria, in Egypt, I have employed it advantageously. In order to meet the objections which were advanced by persons of rank in the army, and to overcome the repugnance of the soldiers, I was the first to have my horses killed, and to eat this meat. At the battle of Eglaw, during the first twenty-four hours, I was obliged to nourish my wounded with horse-flesh."

In 1811, at the request of the Police, Cadet, Parmentier, and Pariset, announced, in their turn, "that horse-meat is possessed of a pleasant taste; that it is as nutritious as that of other animals, and that the workmen at Montfaucon, who eat it, preserve good health." These savants demanded, in the name of the Council of Health, "that the sale of horse-flesh should be permitted, and that an *abattoir* should be established, especially for horse-butchery."

From our own particular means of information, it seems that the horse-skinners (*équarisseurs*) of the abattoir of Aubervilliers, which has replaced the charnel-house of Montfaucon, make excellent daily repasts off of horse-flesh, roasted, or of its soup; they have wonderful health, and even acquire *embonpoint* soon after their entry into this establishment. Other workmen, whose employment occasionally takes them there, such as masons, slaters, &c., at first look at such repasts with a species of horror; but they are not long in changing their opinions, and they end by imitating their companions, so much the more willingly, as the benefit accrues to them of not being obliged to go to the butcher's.

Since, then, it is admitted that horse-meat presents all the advantages that we demand of the ordinary articles of food, having an agreeable taste superadded to the conditions of healthy aliment, how is it that it is not now employed throughout all Europe, to which it offers such precious resources? Whence comes the repugnance that we experience to the use of horse-flesh as food? Simply, as we intend to show, because the different nations of Europe have ceased using it for a long time. A very marked aversion has replaced the predilection which the ancients, particularly the Germans, had for this kind of food. History will show us the cause of this transformation of taste.

The Scandinavians and Germans, devoted to the worship of Odin, preserved and brought up with the greatest care, in the sacred pas-

tures, a race of white horses, destined to be sacrificed to the gods whom they adored. The sacrifice being accomplished, the flesh of these animals was boiled and served up at their banquets. This is, in all probability, the origin of *Hippophagia*, which, being introduced among the people of the North, became an integral part of their national manners, down to the time when Christianity, penetrating northern Europe, succeeded in destroying a custom intimately attached to the rites of the paganism of the North.

The Hippophagia, which was found so united with the rites of the religion of Odin, was an obstacle to the establishment of Christianity with the northern nations. Whenever, in fact, a Scandinavian, even though converted, ate horse-meat, he was led back to the souvenirs of his ancient faith. Thus the Popes, at an early period, prohibited the use of this food : religious policy would have it so.

In a letter written in the eighth century, by Pope Gregory III., to Saint Boniface, Archbishop of Mayence, we read the following passage :

"You inform me that some eat the flesh of the wild horse, and the greater portion that of the domestic horse. Henceforth do not suffer this ; abolish the custom by all means that may be in your power, and impose a lawful penance upon all eaters of horse-flesh. They are unclean, and the practice is execrable."

Pope Zachary, successor to Gregory III., renewed this prohibition.

In spite, however, of the interdict of the Pope, it seems that the use of horse-meat continued for a long time in Scandinavia. What gives weight to this opinion, is the fact that the race of white horses, which furnished the victims for the sacrifices, has never become entirely extinct ; and the only part of the globe where these can be found, free from all admixture, is the barracks of Fredericksberg, belonging to the crown of Denmark.

In direct ratio with the progress of Christianity, the consumption of horse-meat in Europe is seen to diminish, and finally it disappeared. The country where it persisted longest, was also that which last remained faithful to the worship of Odin,—we refer to Denmark. The nomadic nations of Northern Asia, in fact, have preserved even to our day a marked predilection for horse-flesh, and they make their favorite dishes of it—although they possess numerous herds of cattle and sheep. With the barbarous tribes of these lands this taste is most decided, and the Russian missionaries, imitating the popes of the eighth century, find, even at the present day, in the extirpation of Hippophagia, a powerful agent of proselytism.

We have only presented in a brief way an account of the different nations which admit the horse among the number of their sources of food. In the publication which we shall notice presently, M. Isidore Geoffroy Saint-Hilaire has given, with much detail, a long list of nations which, at different epochs, have habitually employed this kind of meat. The learned Professor of the Museum, in this curious enumeration, has taken a survey successively of all the countries of the globe. We refer our readers to his book on this portion of the question.

The employment of horse-meat as food, which M. Saint-Hilaire proves to have been common in former times in many portions of the globe, has regained in our day a certain degree of favor. The descendants of the ancient Scandinavians—the Danes—are the first among the civilized nations of Europe, who gave evidence of a return to this old custom. During the siege of Copenhagen, in 1807, the Danish Government authorized the sale of the horse in the shambles, and since that time this animal has not ceased to furnish food for the abattoirs; there exists, even in the capital of Denmark, a licensed slaughter-house, placed under the supervision of the Veterinary School, that furnishes only horse-meat, which is sold at 12 centimes (2 cents) the pound, average price.

The use of horse-meat, in our day, is slowly extending, and, what is remarkable, it has begun with the very nations who were the last to abandon it. In addition to Denmark, where, as we have just stated, this nutritious material is sold publicly under the supervision of government, Belgium, Switzerland, and Germany may be cited, as having for some years, in part, followed this example.

But it is of importance to make known in detail the successive series of efforts and experiments which have had as their end, the attraction of public attention and that of governments to this question.

In several of his publications, but especially in that on the "*Equarrisage et les voiries de la ville de Paris*," published in 1827, Parent-Duchatelet has collected some very interesting observations on the use of horse-meat. For some time all horses that have died in Paris and in the suburbs, have been taken to Montfaucon; almost entirely lost for industrial purposes they have there been abandoned to a putrefaction, which forms a focus of the most terrible infection, at the very gates of the most brilliant city of the world. Parent-Duchatelet, in seeking how Paris might be freed from the unwholesome charnel-houses of Montfaucon, undertook the subject of the

alimentary employment of this kind of food : and then made efforts to ensure the acceptance of horse-meat as an important aliment for domestic animals and for man himself. But his recommendations commanded little attention. Parent-Duchatelet, then advanced in years, could only point out the truth, but could not effect its triumph in the minds of his very prejudiced contemporaries.

The repugnance which it produces prevents the employment of horse-meat as food. Different savants of our day have united their efforts to overcome this sentiment, which is so inveterate an obstacle.

In 1847, M. Verheyen, a Professor of the *Ecole veterinaire* at Brussels, in a memoir read before the Royal Academy of that city, combatted by means of historic documents of great weight, the repugnance which is generally felt towards the employment of the horse for food.

After M. Verheyen, M. Geoffroy Saint-Hilaire endeavored, in the course of which he delivered at the Museum of Natural History in Paris, to show the alimentary resources which were offered by horse-meat, and, since 1848, he has every year regularly directed the attention of his auditors to this subject.

However, despite the facts reported in the luminous paper of M. Verheyen, despite the convictions so warmly expressed by M. Geoffroy Saint-Hilaire, it was much to be feared that public prejudice was only theoretically modified. The consumption of horse-flesh would never enter the domain of fact, if an end had not been put to simple dissertations on this point.

M. Renault, Director of the Ecole Veterinaire, at Alfort, being more especially occupied with the practical side of this subject, has undertaken a series of investigations of a kind to fix his opinion, and to inform the public as to the alimentary value and influence, as regards the health of man, of the flesh, fat, brains, liver, kidneys, heart, &c., obtained from horses killed at different ages, and in different conditions of embonpoint.

Convinced of the necessity of overcoming, above all things, the feeling of repugnance that the proposition of the use of such food would at first meet, M. Renault thought that it was proper to begin by efforts to eradicate this repugnance, and that the only means of succeeding, would be to make public use of the flesh and *abats* of the horse, differently prepared, and to invite the greatest number of persons possible to imitate his example.

Accordingly, after having personally varied his experiments, M.

Renault invited the officers of the Ecole, at Alfort, one or two at first, then a greater number, to partake with him. At the same time, he distributed some portions of different regions of the body to the employés and workmen of this establishment; he also induced the students to consent that one dish (*baúf à la mode*), at one of their repasts, should by replaced by horse-meat, prepared in the same way. The result of this first series of trials was favorable, for, in the opinion of all who participated in this diet, the taste of horse-meat has no peculiarity which would give rise to the prejudices of which, on that account, it is the subject.

This was, however, still only an argument of moderate value to be cited to the common people. It could be said, with some reason, that there was nothing unnatural in the fact that those connected with a School, where they were accustomed to the sight and daily handling of the dead bodies of horses, should not experience a very decided abhorrence to eating the flesh of these animals. This objection was somewhat plausible.

In order to overcome it, M. Renault had distributed to several workmen and artisans, of the district of Alfort, strangers to the School, portions of horse-meat, so that each one could take what pleased him. The consumers were so well satisfied, that most of them were eager to obtain it, and whenever a horse was killed at the Ecole, which had not been affected by a contagious disease, there was delivered to them certain portions of the same. Without being yet decisive, this second result was added to the value of the first But what was not less important, the repugnance was to be overcome, and the support of persons gained, in whom habits of luxury, or at least, of comfort, would render it most difficult for them to lend themselves to an experiment which many call "disgusting." M. Renault undertook this, and prevailed upon some of his friends to surmount their prejudices. Among this number were found land-owners, magistrates, physicians, governors, and merchants. After having placed the first morsel in the mouth, and having tasted it with unfeigned disgust, they acknowledged how ill founded were their prejudices, and offered to bear high testimony of its character.

At length, a final trial remained to be made. Thus far, a certain number of persons, belonging to different classes of society, had been converted; but their opinion had an echo too circumscribed to become very general. New judges were to be assembled, who possessed, on account of their position and influence in the social scale great authority. These were the chefs d'administrations—those who

were specially charged with the superintendance of food, and of the control of its value and wholesomeness, members of the Council of Public Hygiene, members of the Academy of Medicine, publicists, selected from those whose duty it was to enlighten public opinion on all questions connected with agriculture, hygiene, medicine, chemistry, and all those sciences which have for their object the food, and preservation of the health of man. Such an experiment was of great importance, and it was crowned with complete success. In the beginning of the year 1856, Dr. Amédée Latour, editor of the *Union Médicale*, gave, in his journal, a report of a grand Hippié festival which had taken place at M. Renault's, Ecole d' Alfort, and at which all the guests proclaimed, with unanimous voice, the alimentary merits of horse-meat. The article in the *Union Médicale* was copied in different journals of France and foreign countries, and soon after similar repasts to that at Alfort, were given at Toulouse, Paris, Lyons, and Bordeaux, and public attention was thus seriously awakened to this important question.

In the month of August, 1856, M. Isidore Geoffroy Saint-Hilaire, who had thus far only treated, in his course, the question of the alimentary employment of horse-meat, published, under the title of *Letters on Alimentary Substances, and particulaly on Horse-meat*,—a special work, to exhibit the actual condition of the question, and to defend the economic cause which he had embraced among the first. The treatise of the learned academician has the advantage of exhibiting, at a glance, all the results thus far obtained, concerning the consumption of horse-meat as food, and of supporting, by figures and positive calculations, some considerations which had been, up to that time, too vaguely expressed. It will be useful to give, here, a brief analysis of this work :

M. Geoffroy Saint-Hilaire commences by laying down this physiological principle as incontestably true : *meat is the aliment, par excellence, of man, especially in cold and temperate climes.* He then states the second fact, rigorously established by statistics and social economy, that *a part of the population of our cities, and a very large portion of the inhabitants of the country are unsupplied with meat.* The author appeals, for the establishment of this fact, to the statistics contained in the excellent work of M. Leplay—"*Les Ouvriers Européens.*"

The use of meat being recognized as one of the first requirements for the development and maintenance of the organism, and a portion of the French population being found deprived of it, how can we create such resources, in this connection, as are now wanting? The

way is already discovered, says Saint-Hilaire: it consists in the employment of horse-meat. This material is daily lost by millions of *kilogrammes*. Instead of throwing the bodies of worn-out horses on the garbage-pile, or of abandoning them for secondary industrial uses, give their flesh up for public consumption, and the lamentable deficit, which is remarked in the food of the masses, as regards nitrogenous, or animal material, will disappear by such a course. We may, doubtless, look forward to some resource for the future, either by the acclimation of some new species of animals for food, or by the progress of agriculture; but, for the present, and a long time to come, the only thing to which we can efficaciously resort, is the flesh of the horse, as an immense and inexhaustible reserve. "It is necessary," says Saint-Hilaire, "to hand over, as food, the two millions of rations of horse-meat, which are daily consigned to secondary uses, or even absolutely lost."

Saint-Hilaire next examines whether the use of horse-meat could produce any inconvenience, if this food is unwholesome, and if hygiene condemns its use? The answers to these questions are, in every respect, favorable to this alimentary product. Aside from the Chinese physicians, who reject from consumption either the flesh of all horses, or, at least, that of horses of two colors, and aside from a passage of Galen, often quoted, though incorrectly, there exists, among physicians, veterinary surgeons, and naturalists, only one opinion as to the wholesomeness of horse-meat. Persons have been wholly nourished with this food, during weeks, at Copenhagen, Falzburg, and other besieged cities,—even at Paris, during some months in 1793 and 1794—and this unusual diet never produced either sickness or indisposition. Further, the flesh and broth of the horse, administered, at different times, to sick and wounded, by military surgeons, and especially by the illustrious Larrey, have always been successfully used. In Egypt, during the siege of Alexandria, soups made from the horse have even contributed to the removal of an epidemic scorbutus, which raged in the army. Thus horse-meat is perfectly innocent, so far as the healthy are concerned, and, in a large number of cases, it will offer excellent resources for the sick.

But this meat is not only healthy, says M. Geoffroy Saint-Hilaire, it is, furthermore, of an agreeable taste. This point, it is true, is far from being unanimously admitted by public opinion, although it has already made some important concessions. The flesh of the horse has been considered, for a long time, as disagreeable in taste, very tough, and difficult to masticate. Even at the present time,

this is believed and reported about it. Among those who rail at the use of horse-meat, as tough, and of bad taste, we encounter some who have accidentally used this article in the army, during sieges, or during retreats, circumstances in which animals, as well as men, are found famished, worn out with fatigue, or, indeed, wounds. The flesh of horses, in such conditions, cannot be properly appreciated. After these first adversaries, comes a crowd of those who have never tasted the meat of, nor broth made from the horse, and who, consequently, do *not know*, but *believe*,—who do not pronounce a *judgment*, but who obey a *prejudice*. But so many facts can be opposed to this prejudice, that it is impossible not to perceive the slight grounds upon which it is founded. The results of the numerous and authentic documents collected by M. Geoffroy Saint-Hilaire, furnish us the following facts:

The savage, or wild horse, is hunted as game in all parts of the world where he is found: in Asia, Africa, America, and, in former times (possibly even now), in Europe. The same thing is true of all animals of the same genus with the horse. Zebras, asses, and quaggas are considered excellent game, often as the best, in the countries they inhabit.

The domestic horse, himself, is used as a source of food in Africa, America, Oceanica, throughout nearly the whole of Asia, and in various parts of Europe. Its flesh is considered good by nations differing very much in their mode of living, and belonging to very different races, such as the Negro, Mongolian, Malay, American, and Caucassian. It was very much esteemed, down to the eighth century, by the ancestors of some of the great nations of Western Europe, with whom it was in general use, and who only renounced it, and with regret, in obedience to prohibitions which were purely religious or political. It has often been employed, even in our day, in Europe, but under peculiar circumstances, for the nourishment of a large number of travellers, and especially of soldiers, during their campaigns. It has often been mistaken, by troops to which it had been distributed, and in cities, by people who had purchased it, for beef. "Horse-meat is very commonly sold (in Paris) under the name of beef, or as goat's meat, in the restaurants (sometimes of the highest order), without the consumers suspecting the fraud, or complaining of it."

In fine, horse-meat has been pronounced excellent by all those who have submitted it, before reporting on its qualities, to experiments properly made,—by all those who have tasted it under the requisite conditions, that is, when obtained from healthy horses, that have not

been fatigued. It is then perfect, as roast meat, and, if it is desired as boiled meat, it is precisely because it furnishes one of the best broths, probably the best known. It is even found good when obtained, as in the experiments of Lavocat and Joly, at Alfort and Toulouse, from horses not fattened, and of seventeen, nineteen, and even twenty-three years of age. This last fact is of considerable importance, since it establishes the possibility of making useful, a second time, on account of their flesh, those horses which have been employed, even up to old age, on account of their strength, by finding in their meat, at the end of their lives, and when their labor has largely covered the expense of their rearing and their support, a further value, a profit almost gratuitously afforded. Horse-meat, Saint-Hilaire says in concluding, so abundant and so wholesome, is at the same time good and suited to be used for public consumption.

Such is the nature of the contents, abstracting the figures and documents, which it contains, of the treatise of the wise Professor of the Museum.

With the aid of the numerous facts, from the different authors who have given attention to this subject that we have passed over in review, we shall be able, ourselves, to consider this important question with profit, and to find out whether we can apply these results, at present, to practical uses.

To decide whether horse-meat can be admitted at present among the number of our habitual alimentary articles, it seems necessary that the three following points should be placed beyond a doubt:

I. The taste of horse-meat is agreeable, and its use is attended with no detriment to public health.

II. It is economical.

III. It exists in sufficient quantity to play an important rôle in the alimentation of the masses.

Let us rapidly examine each of these points,—

I. After the experiments repeated this year (1856), in different cities of France,—after the *Hippophagic* repasts of Alfort, Toulouse, Lyons, Paris, &c., we believe that no one can retain the least doubt with regard to the qualities, and the agreeable taste of horse-meat. This is a result which seems to us, from this time forth, safe from all discussion. Moreover, if it is permitted us, we would add our own special testimony to that of so many persons who have recommended it. During last July, after having made some experiments at the Ecole Veterinaire of Alfort, on two horses that had just been killed, we carried the *psoas* muscles (the *fillet*) of these animals home,

in order to inform ourselves with regard to the qualities of this meat, and to be able to speak *de gustu* on the controverted subject. It is not necessary to employ many phrases, nor to make any preparations to say that the meat, eaten roast, boiled, and in soup, was excellent. It would be impossible, we believe, for any one, not previously informed, to distinguish a roast fillet of horse from one of beef. As for boiled horse, it yields, in no particular, to boiled beef, and the soup that it furnished was possessed of an agreeable taste, with a very agreeable peculiar aroma. Any one who wishes to repeat the experiment we have made, will certainly arrive at the same conclusion.

The slightest doubt cannot remain, as to the perfect wholesomeness of horse-meat, after the facts we have already enumerated, in giving the analysis of the book of M. Geoffroy Saint-Hilaire. It is perfectly clear that constant use of this article does not produce any detriment to public health.

II. Would the employment of horse-meat be economical? It was remarked, when this subject was first started (and we partook of the feeling), that it would be impossible to use, for consumption as food, old and worn out horses, such as are daily killed in the *equarissoirs;* —that it would be necessary to devote, to alimentary purposes, animals in good condition, killed in consequence of some accident which rendered their further use impossible, and hence this resource would be very limited,—that we could not conceive of rearing and fattening horses with reference to their employment as food, on account of their high price, and, in fine, that, with these restrictions, the employment of horse-meat could not be economical. This argument, serious at the time it was made, has lost all its value, since experience has proved that horses old, worn out, exhausted, in plain terms, real worthless nags, still furnish meat which is quite edible. Were the horses young which furnished meat and soup of such good quality, at the repasts of Alfort, Toulouse, Paris, and Lyons? Had they been fattened? Were they of great value? Their ages were from *sixteen to twenty-three years*, and they were completely useless. One of these horses, *the youngest*, seventeen years old, had been sold to the equarisseur for not more than *twenty-five francs*. They were old servants, worn out with years and labors. Nevertheless, their flesh was considered tender and savory. In view of this fact, we must admit that the question of economy is decided most favorably.

III. Finally, would horse-meat furnish a sufficient quantity of alimentary material, so as to play an important rôle in the alimentation

of the masses? The information and numerical statements presented in Saint-Hilaire's *Letters*, give an affirmative answer to this question. Saint-Hilaire found, by combining the elements furnished by our official statistics, and other documents, as to the number of horses in France, the duration of their lives, and the conversion of horses of medium size into food, that the meat of horses which have died a natural death, or have been killed every year in France, is equivalent to about one-sixth of the beef or pork which is used annually for public alimentation,—to two-thirds of the mutton and goat's-flesh, to one-fourth of all the meat from the shambles and the pork-shops, or what is equivalent to more than two and a half millions of our medium rations of meat. It cannot be contested, in the presence of these figures, that horse-meat, from its great abundance, can furnish a very important resource for the alimentation of the laboring classes of cities and the country.

The following conclusion results from the preceding discussion: that since millions of kilogrammes of good meat are lost every year in France, and millions of men are deprived of this kind of food, it is necessary to introduce the flesh of the horse as an article of public food.

As a truth once acknowledged should not remain idle, we must express the wish that the Government would authorize, for the sake of the experiment, *the public sale of horse-meat* in the principal cities of France.

In France, despite whatever may be said to the contrary, routine governs all proceedings, and we love to be encouraged by the example of our neighboring nations. Let us, then, hasten to declare that the novelty which we demand is not so novel as one might believe. Horse-meat has been, for some time, an article of common consumption in many portions of Europe. There are public stalls in Sweden and Denmark, where this kind of food is sold. Such are also found at Schafhausen, in Switzerland, at Vilvorde, in Belgium, and especially are they found in a very large number of the German cities.

Some details, as to the employment of horse-meat in Germany, will not be out of place here. In 1850, yielding to the solicitations of the Society for the Protection of Animals, the Minister of the Interior, in Austria, declared that horse-meat might be used as food for man. The first experiment, with the design of admitting the horse as a source of food, was made at Vienna, October 21st, 1850. M. Wildner, of Maithstein, a great advocate of horse-meat, had killed, at his

house, in Doblenz, a well-fed horse, whose flesh was distributed to the poor families of the suburbs. After the announcement of this first attempt, Dr. Wildner had the first horse-butchery opened in the beginning of the year 1854. Although the meat sold from twenty to twenty-five centimes (three and a half to four and a half cents) the pound, according as the cuts were furnished from the fore or hind quarters, yet the number of buyers from the suburbs of Vienna was so great, that the success of the enterprise seemed certain. On the 20th of April, 1854, the sale of horse-meat was officially authorized, and subjected to rules, in Lower Austria. About the same time there was established, in the suburbs of Vienna, the first butchery for the sale of horse-meat. A female, well known for her benevolence, Madame Emilie de Braundal, assumed the first expense, and furnished the capital to the butcher whose stall was opened at Brigittenau, May 6, 1854. Two new butcheries were established afterwards, one in the Faubourg of Lichtenthal, May 24, 1854, and the other in the Faubourg of Gumpendorf, June 10 of the same year. Lastly, a new establishment of the same kind has been quite recently opened in the Faubourg of Landstruss. There are, then, actually four butcheries in Vienna where horse-meat is sold. In the environs of Doblin, a similar establishment exists, and another at Funfenhaus; and lately a stall has been opened at Inzersdorf, in the Wienerwald! An attempt made at Penzing has not been followed with satisfactory results.

The necessary permits for the opening of a stall destined for the sale of horse-meat, have been granted by government. The grantee need not be an expert butcher; it is sufficient if he engages to confide the management of his business to experienced journeymen. In Vienna it is further required that the applicants prove their possession of a place fitted for their business. Before, however, the permits are granted, the Commissariat of the Markets and the town authorities are consulted. In case of refusal, the applicant can appeal to the Council of State. But, in general, candidates that have been able to prove their professional fitness, either as butchers, or on account of their knowledge of horses, obtain permits, should the police not give unfavorable information about them.

The horses were killed at first in the two *abattoirs* appropriated to cattle, but the Viennese butchers having protested against this promiscuous use of the *abattoirs*, a special one has been appropriated for horses.

The superintendence of the sale of horse-meat, as well as that of

provisions in general, is entrusted to officers charged with the inspection of the markets. Horses intended to be slaughtered are examined by a special inspector, and prepared in his presence. The inspectors of the markets also exercise control over the localities where horse-meat is sold, and furnish certificates or permits to kill, which must be handed over for every horse destined for consumption as food.

The following extracts, concerning *the consumption of horse-meat in Germany*, are taken from a note which was published in 1855, by Dr. Lortet, President of the Society for the Protection of Animals, at Lyons:

The prejudice against horse-meat, says the Doctor, is no better founded than that which existed towards potatoes, for a long time after their introduction. It ended, also, by total disappearance. The example furnished by men of good judgment to their fellow-citizens, was sufficient to overthrow this unreliable prejudice. The Society for the Protection of Animals, at Munich, has especially directed its efforts to this end. Its appeal has been heard throughout all Germany. In different localities committees have been organized, who have assembled at banquets to eat horse-meat. It will suffice to cite some localities, in the order of their dates:

1841. The use of horse-meat was adopted at Ochsenhausen, District of Bibrach, in Würtemberg. Since that time an authorized abattoir has been established in the place, under the superintendence of a veterinary surgeon. There is sold weekly the flesh of five or six horses. There has been, likewise, during the last ten years, a great consumption of the same food at Benzenhause, on the borders of Lake Constance.

1842. A feast was prepared for 150 persons at Königsbad, near Stuttgardt, at which horse-meat was alone served up, prepared in different ways. Since that time, the use of horse-meat has spread rapidly through all Würtemberg.

1846. An ordinance of Police, issued by the government of Baden, reads as follows: "Since the employment of horse-meat as food is becoming every day more common, we hereby order as follows: 1st. Only healthy horses shall be killed, and those who slaughter diseased horses shall forfeit from 10 to 20 francs fine. 2d. Every horse, before he shall be slaughtered, must be examined by a veterinary surgeon, who shall grant or refuse the permit." In the same year the government of Schafhausen also authorized the sale of horse-meat.

1847. Throughout the whole country of Carlsbad, in Bohemia, the use of horse-meat had become common. At Zittau alone, 200 were slaughtered in a year. During the course of this year, numerous butcheries, under the supervision of the police, were granted in Bohemia, Austria, Saxony, Hanover, the Duchy of Baden, Switzerland, and Belgium.

1850—1851. The Society for the Protection of Animals, at Hamburg, had 135 horses killed and disposed of for food. In 1835 there existed already five horse-butcheries in Berlin, and 350 horses were slaughtered there during the course of the year 1853. In Vienna, the same year, there was a riot to prevent the assembling of a party, where it was intended horse-meat alone should be employed. But in 1854, 32,000 pounds of it were sold in 15 days, and it is estimated that the number of inhabitants who now employ horse-meat daily is 10,000. This meat is sold only at from 15 to 20 centimes (two and a half to three and a half cents) the pound. All who have eaten it have found it equally agreeable, whether roasted or boiled. A ragout has the taste of venison. The steaks, smoked tongue, sausages, and the brains are regarded as delicate morsels.

The preceding note appeared in Lyons, March, 1855. Here is a more recent document, which shows the progress made in Germany since that date. It is a notice of the Society for the Protection of Animals, at Munich, published a few months since, and which has been translated for a similar Society in Paris, by M. Richelot, its General Secretary :

The consumption of horse-meat increases still more in Vienna, eight new special butcheries having been established in 1855. The prejudices against the flesh of an animal the most carefully reared, and nourished with the purest food, are gradually disappearing. Mr. Plattner, the banker of Nuremberg, known for a long time for his philanthropy, with the consent of the aulic councillor Herner, founded a butchery for horse-meat. At this time there are organized restaurants, where one can procure horse-meat, prepared in different ways, at 3 kreuzers (12 centimes, 2 cents) a ration. A similar establishment has just been founded at Haidhausen, by M. de Meckeln.

In 1854, 166 horses were slaughtered at Nuremberg, and 344 in 1855. There also exist, in all parts of Bavaria, butcheries for horse-meat, as well as in the city of Munich, and its environs, and these establishments thrive in their business. According to an official Report, communicated to the Society of Munich, Stamer, the butcher, killed from 1848 to 1855, on an average, 100 horses a

year ; Greene, 60 ; Hartman, 50 ; which would give, counting 300 pounds to the horse, a total of 477,000 pounds of horse-meat consumed during that period, in one district alone. What tortures have thus been spared to superannuated horses? What spectacles, demoralizing to the people, prevented?

The following fragments of Reports made, anterior to these, to the Society for the Protection of Animals in Paris, by M. Richelot, on the Societies of Hamburg and Vienna, may be read with interest, as a complement to the preceding note :

In a passage relating to the Society at Hamburg, he says, "the barbarities to which the noblest animals are exposed, have most especially attracted its attention, as in the case of all the Societies for Protection, and like the most of the German Societies, it has believed that, by encouraging the consumption of horse-meat, a sure means was discovered of securing the animal from numerous tortures. Of late years, it bought horses that were maltreated, either to sell them to more humane masters, or to have them slaughtered, and the remains offered for sale. In 1853 it had thus purchased 174 horses, but its mission in this respect has been very much contracted since the government, in compliance with its request, permitted the establishment, in 1854, of several butcheries of horse-meat. According to the Report of Mr. Warbourg, these butcheries are well supported, and the prejudice against this new food has completely disappeared."

Mr. Castelli, President of the Munich Society, confirm the facts reported by M. Lortet, as follows :

"In Vienna there were slaughtered, during 1854, in the five special butcheries, 1,180 horses, who furnished 472,000 pounds of good meat, at a low price."

Almost all our journals (July 1st) published the following article from the *Austrian Gazette*, which extracted it from the documents furnished by the Vienna Society :

"During three years, since the sale of horse-meat was allowed in Vienna, 12 butchers have slaughtered 4,725 horses, which have furnished 1,902,000 pounds of meat, distributed to the needy in 3,804,000 portions, of a half pound each. The product of the meat, skin, tongues, bones, and hoofs, amounted to 225,085 florins."

The example of our neighbors authorizes us to demand the adoption, in the principal cities of France, of the economical measure which Germany congratulates itself upon having inaugurated.

We will simply add that it would be indispensable, in cases where permission is granted to butchers to sell horse-meat to the public, to

have a body of inspectors, composed of veterinary surgeons, whose duty it should be to see that the horses slaughtered were not affected with *glanders* or *farcy*—those terrible diseases which are transmissible from the horse to man. The flesh of a horse affected with glanders or farcy, having undergone the process of cooking, could, doubtless, not communicate these diseases to persons using it as food, for the heat would destroy the morbific principles contained in the tissues. But individuals who should be obliged, by their occupation, to handle such meat, as butchers, men employed in the abattoirs to cut up the animals, and cooks themselves would be exposed to serious danger, this terrible affection, as we have said, being communicable to man from the horse. But with a Board of Inspectors, it would always be easy to keep from consumption as food, any animal affected with these maladies. These precautions being adopted, the general consumption of horse-meat offers no inconvenience, and we cannot close better than by quoting the words in which M. Isidore Geoffroy Saint Hilaire demands the adoption of this measure.

It is inevitable, says the learned naturalist, that whatever succeeds with our neighbors is repeated by us. Some purchasers will present themselves at first, attracted by cheapness, or for the sake of the experiment; then an example being given, a larger number, and soon a multitude of those with whom economy is always a necessity —that is to say, the immense majority of the working classes. Several kilogrammes being furnished at the price of one, it would be possible for millions of Frenchmen almost daily to eat meat, instead of once a week, as in our cities, or weekly, instead of monthly, or still less, as in the country; and such benefits can be easily appreciated by any one who does not wish for himself what he sees at his neighbor's. Would that the government would decide to take the first step; the rest will follow of its own accord, and the prejudice against horse-meat will join that against potatoes, on the long list of errors and blunders from which the progress of light has freed mankind.

When it is recollected that a healthy, invigorating, and economical article of food is thrown away in France by millions of kilogrammes, and that there exist, on the same soil, millions of individuals, having food of an insufficient character, and whose intelligence and moral character is necessarily altered, in consequence of the wretched condition of their aliment, we should hasten to place at the disposal of the latter, this precious resource, and encourage, in every way, whatever would help to extend its use among the other nations of Europe. L. H. S.

REVIEWS AND BIBLIOGRAPHY.

Human Histology, in its Relations to Descriptive Anatomy, Physiology, and Pathology; with 434 Illustrations on Wood. By E. R. PEASLEE, A.M., M.D., Professor of Physiology and Pathology in the New York Medical College, &c., &c. Philadelphia: Blanchard & Lea. 1857.

A necessity which all American students of medicine have experienced, has at length been supplied, in the production of a sound and practical work on Histology, or "the scientific classification and description of the structural, or organized elements of the solids and fluids of the living organism." Whilst a student, this want was felt severely by us, and the same complaint has been uttered frequently by others. We congratulate the profession generally, that a definition can now be gained in their studies, and that conjectural suppositions, need no longer mislead as to actual structural conditions, their normal functions, or their pathological states.

To Prof. Peaslee we are indebted for this valuable addition, in his lately published work on Human Histology. The plan of this work was formed nine years ago. Although there were productions in England, France, and Germany, embracing many of the subjects, yet none included the entire aim of Prof. Peaslee, by giving, 1st, "*A connected view of the simple chemical elements, of the immediate principles, the simple structural elements, and the proper tissues, entering into the composition of the fluids and the solids of the human body.* And 2d, *To associate with the structural elements and the tissues, their function while in health, and the changes they undergo in disease.*" The elementary measurements being reduced to the fractions of an inch will also facilitate the American student.

Mere descriptive anatomy, so long the basis of medical education, will not answer at this period, when physiology and organic chemistry have made such rapid strides. Histology, or minute microscopic anatomy must not only be taught, but *learned;* not merely as regards its special investigation into the structure of a single element, or of an entire organ, but also as respects their function. In bold relief to the darkness and uncertainty attending gross anatomical investigation, stands that beautiful science now known as physiological anatomy, from which the future foundation of sound scientific medical treatment, and successful operative surgery must arise. Descriptive anatomy is the mere A B C of the solids alone; but experimental and chemical physiology with histology, form from this alphabet a

language, which gives distinctness to outline, and definite conception to vague ideas.

Not only the solids, but the isolated fluids—as the milk, chyle, blood, and other secretions—fall within the domain of Histology, inasmuch as they contain cells, granules, nuclei, or the formative elements. These, and the tissues are embraced in the work. Hence Prof. Peaslee has divided it into two parts. The 1st is devoted to Stœchiology, or an account of the immediate principles of the fluids and the tissues. And the 2nd embraces Histology, or a description of all the tissues and fluids, containing histological or structural and organized elements of living organisms. The term "stœchiology" is somewhat new, although we believe it was first used by Robin and Verdeil. The first division under this head embraces "the simple chemical elements entering into the structure of the human body (15 or more in number)." It exhibits the physiological necessity, of our food and drink containing, at least part of these elements. Hence the variety of a food that is absolutely necessary for the perfection ing of health; milk and eggs perhaps being the only aliment containing them all. It also refutes the absurd ideas of some pragmatical folks, that *minerals should never be used as remedies*, since some twelve or more simple elements are mineral, and enter into our food, whether it be vegetable or animal. Nor is the notion that "no mineral except such as form part of the body," should be used remedially any more tenable, since the same objection would hold against *all* vegetable remedies, viz: opium, lobelia, &c., &c., as not one of them enter into the composition of the body. "For if it be said that the active principle of vegetables (as morphine, quinia, &c.), contain only the elements, i. e oxygen, hydrogen, carbon, and nitrogen, yet it is certainly true that strychnine, hydrocyanic acid, &c., contain some of these elements, and are far more destructive to human life than any mineral substances known."

The second stœchiological division comprises "the immediate principles of which the human body are composed." These are defined by Robin and Verdeil as "the last bodies constituting the organism to which the tissues can be reduced by mere anatomical analysis, and which admit of no further subdivision without *chemical decomposition*." The eighty-four immediate principles, being all compound, except oxygen, hydrogen, and nitrogen, are divided into two groups; the first including those principles which are crystallizable or volatile without decomposition,—the second including those principles which are *not crystallizable* and not volatile except from decomposition.

Oxygen is to be regarded as an immediate principle only when existing in a free state in the body; as in venous or arterial blood, in the bronchial tubes and air cells, &c. In the blood it exists in a liquid state, and probably in the corpuscles alone. Prof. Peaslee does not take so narrow a view of the oxygen consumed in the respiration, as Liebig and his French and German followers, viz: its final destination in combination with the tissues, and the sugar, starch, and fats from the food, for the production and maintenance of animal heat. He considers heat as the *result* of nutritive changes of all kinds, but not the *object* of them. Oxygen is a vital stimulus over the tissues, whilst the incidental heat is indispensable to the organism.

Hydrogen, although existing normally in the stomach, colon, and cœcum, and in very small quantity in the expired gases, has not yet been found in the blood. In the lungs and large intestine, it may be found as carburetted and sulphuretted hydrogen. It is also disengaged from abscesses near a mucous membrane, by the putrefaction of pus, or of organized tissue. (We are inclined to believe that these gases are sometimes generated in the blood in yellow fever, and also that the disengagement of hydrogen compounds, after the bursting of an internal abscess, or from surrounding disintegration, with its direct entrance into the vessels, may ensue, and sometimes with suddenly fatal consequences.) Carbonic acid exists in the body in solution, or in a gaseous state. There is more in *arterial* than in *venous* blood. It is set free in the lungs from the carbonates by the pneumic acid. Originally, it is formed by the action of oxygen on the tissues, and the calorific elements of the food.

Nitrogen exists free in the air cells, in the blood, and in the intestinal gases. Animals suffering from emaciation inhale more than they return. Protoxide of hydrogen, or water, exists in every fluid and tissue, even in the enamel. But no constituent of the body has always the same amount, or indeed of any other immediate principle. As the water varies, so do the immediate principles. "Hence the error of those who would find the cause of diseases in any one tissue or fluid alone, or would attempt their cure by water, or any other immediate principle exclusively." We cannot attract too much to this truthful enunciation. Water exists in a gaseous state in the halitus from the lungs—it is the only instance. Certain *organic substances*, as osteine and muscaline, have the power of *fixing* a greater amount of water than their own volume and weight. Organs formed principally of these substances (and hence containing much water) "alone live independently and on their own account—alone present

the double vital phenomena of composition and decomposition." Besides giving to organic substances their mechanical properties, to fluids their fluidity, and to the hard parts their flexibility and tenacity, "water gives to all parts the possibility of manifesting their chemical properties also, hence that instability characteristic of organized tissues, and the constant acts of combination and decomposition." "But it also, with all these advantages, confers the liability to sudden changes in the blood, or in the organs, from putrid, purulent, or mephitic infections, facilitates the transmission of poisons, procures the aptitude to decomposition, and hence in many cases *induces sudden death.*"

The dissolved salts in the fluids and tissues, serve as solvents for other immediate principles, viz: the soda and potassa in the serum, dissolving certain fatty principles therein. But none of the salts combine with the principles resulting from *dis*-assimilation, except common salt, which unites with urea, forming the chloro-sodate of urea. As such it exists in the blood, in the vitreous humor, and in part also in the urine. Bone tissue also is formed by the phosphate of lime combining with the osteine in connection with water. The earthy salts are found in every fluid and tissue in the body; they are indispensable in our food as they contribute to assimilation, and they aid in dis-assimilation by yielding their bases to the organic acids, such as the uric, hippuric, &c. By these combinations animal heat is partly a resultant.

The chemistry of food has lately attracted more attention from the practitioner. Liebig discovered that the phosphates and carbonates of soda might replace each other in the blood without detriment. Hence if the diet was of bread and meat, the blood contained no carbonates, unless potatoes were added. If fruits alone were eaten, the blood resembled that of the ox or sheep, while the urine became an index, by evidencing in the first case the alkaline phosphates, and in the second the alkaline carbonates. The observations of Bence Jones, as regards the urinary evidences in chorea, delirium tremens, and encephalitis, are referred to by Prof. Peaslee, and cannot be too frequently repeated to rebuke the display of contempt amongst many so termed "old and experienced practitioners," who, to distract from their ignorance of the value of urinary analysis in many diseases unconnected with kidney derangement, endeavor to keep scientific diagnosis within the scope of their own want of knowledge and unprogressive attainment. The sections devoted to the investigation of the blood and urine salts, evidence a masterly discrimination,

nothing being omitted that would be of practical value. The student and practitioner will be more than remunerated for the expense and time, by the careful study of this portion of the work alone. Although many works have appeared on these subjects, yet in none will be found such useful condensation, or such winnowing of the chaff from the wheat. On every page, whilst quoting freely from others, the author makes apparent his own impress. It is useless, at this day, to stand behind one's "professional dignity,"—the coming men must *know*, if they wish to keep up in the great professional race. And, although every day we see men who have succeeded more by the study of the *people* than of their *profession*, yet, as a general thing, their sunny years are short-lived, and their fame dwindles as rapidly as their success overgrew to its bursting.

Under the division "Neutral Nitrogenized Immediate Principles," we will merely quote the author's words as to the origin of urea: "It is decided that urea is formed in the blood, and it is doubtless formed *from* creatine, uric acid, and probably inosic acid also, by the action of the alkalies, and of free oxygen *(Schwann)*; and since creatine is produced by the waste of muscular tissue, strong muscular exercise increases the urea in the urine. Thus, also, in delirium tremens, and all states attended by intense muscular actions (convulsions, &c.), a similar increase occurs. But urea probably also results from the decomposition of *any* tissue containing nitrogen, and not from that of the muscles alone. Moreover, if an excess of nitrogenized food is absorbed into the blood, it is excreted in the form of urea, this substance being the last and lowest in the descending scale of the metamorphosis of the tissues, while the lactic, uric, and oxalic acids, creatine and creatinine, constitute the preceding grades. The idea of a 'urea diathesis' is thus seen to be untenable." We hope, by attracting to this digest, that a more philosophical view may be taken in the treatment of many conditions of the system.

"Sugars, or neutral non-nitrogenized Immediate Principles," form the third division. Hepatic or diabetic sugar has always possessed great physiological interest, and the pages devoted to the exposition of the views of several scientific observers, and of the author's own, will be read with profit.

The fourth division treats of the "Fatty Principles." To the histologist, oleine, margarine, stearine, and cholesterine (or bile fat), are of special importance, although all the fatty principles are of high physiological interest. They for the most part exist in a fluid state, excepting the four just mentioned, which are sometimes patho-

logically found solid. Carbon, hydrogen, and oxygen alone exist in them in definite proportions. They are ready formed both in vegetable and animal organisms. The author does not agree with Robin and Verdeil, in thinking them sometimes the result of *dis*-assimilation. In the human body the fatty principles exist in three different conditions: 1st, As adipose tissue, enclosed in cells; 2nd, In chemical combination with other elements, as in the organic matter of epithelium, nails, horn, and hair; 3d, As oil drops, or fat-globules, without any true envelope, and which are themselves made up of several of the fatty principles united "molecule to molecule," and in this form they enter almost every fluid and tissue (excepting the teeth and bone). In the brain, in the cholesterine in the blood, and in certain fatty acids, the elements are in a state of isolation. The corpus lutcum is more abundantly supplied than any of the tissues. In encephaloid, atheroma, and other morbid growths, the fat-globules abound. Fatty degeneration is an instance of their replacement of the normal tissues, and this sometimes with fatal result. "Fat-globules exist normally in the urine, semen, prostatic fluid, saliva, nasal mucus, synovia, and bile, and in the serosity of the pleura, of the peritoneum, and that produced by a blister." Blood serum contains fat even when mixed with other fluids (as urine), and pus also contains it in notable quantity. In the duodenum and jejunum the fatty principles are converted into an emulsion by the pancreatic fluid; the lacteals then absorb it, and it enters the venous current through the thoracic duct. According to Boussingalt, *the amount of fat in the blood does not vary greatly*, whether the food contains much or not. This remark is peculiarly valuable in reference to certain forms of phthisis (where the saponified fats are greatly diminished), as regards the employment of fats or oils. The blood amount of fat being almost permanent, while the epithelia and the various tissues require a regular supply to exist normally, unless a due balance is preserved, disintegration must necessarily result; and no matter whether the blood obtains it from the tissues, or the tissues derive it directly from the blood, yet it must exist, and be supplied by food or by dis-assimilation, else, to use a homely expression, it will be "robbing Peter to pay Paul" the whole time. Its use as a calorific element is well known. Although the human liver has a fat generating power, yet adipose tissue depends more likely for renewal from the food, independent of the inherent capacity of cells to elaborate their own nutrition from certain elements.

Cholesterine (or bile fat) exists normally in the bile—its produc-

tion Prof. Peaslee attributes to the dis-assimilation of the liver tissue itself. It is almost the entire component of gall-stones. Pathologically it is found in the blood, brain, nerves, cerumen, crystalline lens, and in certain tumors. In icterus it is increased; and although it is generally believed not to exist in the urine, the writer of this article has found it after a severe attack of that disorder, the urine being as high colored as brown stout. Being a non-saponifiable fat, cholesterine resists alkaline decomposition.

Oleine, margarine, and stearine are the three immediate principles of adipose tissue, each being composed of a fatty acid with the oxide of lipyl. From the latter glycérine is formed. For the uses of the fatty principles in the organism, the work should be consulted. Prof. Peaslee makes some valuable remarks respecting the emaciation following profuse suppurations, long-continued intellectual labor, and exhausting venereal excesses; also as regards the easier digestion of albuminous substances when mixed with fat. It is certainly indispensable in the generation of all the nuclei of primordial cells. Cod liver oil not only aids the digestion of albuminous substances, but it is easily assimilated by parts requiring fat. In protracted diseases it sustains the strength, whilst perhaps the morbid process exhausts itself, or till healthful cells are generated with renewal of normal tissue. It therefore ceases to be a medicine and becomes a food; and the author agrees to the propriety of mixing it with the diet, in preference to giving it between meals. If it disagrees, an alkali can be added, thus aiding the pancreatic fluid in preparing an emulsive fluid fit for absorption by the lacteals.

Class 3d includes the "Organic Substances, or Coagulable Principles." These are all compounds of carbon, hydrogen, oxygen, and nitrogen. They have no *definite chemical composition*. However, their limits of variation are narrow; therefore, the composition of fibrin, albumen, &c., is not at all times identical. Most of the earthy salts unite with these substances, so that when concretions are formed, a certain quantity of organic substances is fixed and retained within them. The metallic salts also unite powerfully with them. Hence advantage is taken of this fact in the preparation of pathological specimens. The metallic poisons, such as arsenic, mercury, &c., act in like manner, by causing local erosions, and also by rendering the tissues no longer capable of vital renewal.

The albumen and fibrin exist ready prepared in the food. By digestive preparation they are rendered fit for assimilation. Osteine and elasticine are not found in early embryonic life; and caseine

appears in the female only after puberty. "It is probable that neither of these principles can be directly *transformed* in the organism into another." Still less, can any tissue once formed, be directly transformed, as cartilage into bone, &c. When this appears to be the case, the former tissue is *replaced* by the latter.

All these organic substances are assimilable, and do not appear in the urine except in certain kidney disorders. Even osteine, if associated with carbonate of lime, will sustain an animal a long time. Gelatine is not assimilable, but appears in the urine. (It would, therefore, be difficult to fatten on jellies, and their value in the sick room is at times more than questionable). No *one* organic substance can long sustain life—accessories from other classes must be taken. No *one principle* (not even the organic substances), can form a tissue with vital properties. In croup, the so-called false membrane, Prof. Peaslee says, "never becomes vascular." It would have been better to have said "rarely," as the writer has twice witnessed its organization. Organic principles are to be distinguished from histological elements, as the latter have a determinate form, and are not constituted from a single substance. Other principles besides salts and certain compounds exist even in a single cell. "Chemistry, alone, then, does not give a just idea of the organic substances; their examination is a part of anatomy." They leave the body in the form of lactic and uric acid, urea, carbonic acid, water, &c.

As far as the science of the day has progressed, the author, in addition to his own views and researches, has sifted out nearly all the points of any practical value. We will, therefore, be obliged to hasten over many important subjects, and to omit more. We cannot, however, pass over the chapter on albumen without recording Prof. Peaslee's view of "albumen, and not fibrin, being the pabulum of the tissues," as from it they are mainly, if not entirely, developed and nourished, and that in them it is assimilated according to their various constructive necessities. Fibrin, itself, most probably owes its origin to albumen. One of the chief uses of fibrin is to act as a kind of *scaffolding* for the development of the tissues; in exudations it forms the *nidus* for adventitious growths. *It does not exist in muscular tissue* at all. In composition it differs from seralbumen, by containing an atom more of oxygen, and one less of sulphur. Fibrillation is the highest organic action of fibrin. Albumen has no such property; it coagulates into a merely hyaline substance, or is minutely granular. The vitality of fibrin is diminished or destroyed by the proto-chloride of mercury, sulphate of soda, nitrate or carbonate of

potassa, and the chloride of sodium, &c. Hence, advantage is taken of this fact in preventing, or modifying its formation into adventitious membranes. (If these agents are administered too freely in the scrofulous, or in persons of low vital action, the exudation may be converted into pus. So that pus is not, at times, so much an evidence of the *disease* as of the *doctor!*) Prof. Peaslee regards fibrin as a compound, as is also the case with caseine. He does not adopt Lehmann's view of its origin, by the mere chemical action of oxidation, but thinks, if fibrin possesses vitality, it has power of self-development from the analogous compounds, albumen, fats, and a few saline substances. It also undergoes its own metamorphosis, and like albumen is finally converted into urea, uric acid, &c.

The whole chapter on Fibrin is a most comprehensive revision, and should be carefully studied. It impresses facts which reduce themselves to therapeutical indications, and will serve to do away with much irrational and unscientific practice amongst careless and superficial medical observers. Under "Solid, or Demi-solid Immediate Principles" are ranked globuline, crystalline, musculine, osterine, cartalagine, elasticine, and keratine. Musculine exists in striated and non-striated muscular tissue. It differs from fibrin by being soluble in water containing $\frac{1}{10}$ its weight of chlorohydric acid. It is formed from the albumen and albuminose in the blood. "The necessity for admitting that muscular tissue is formed from the blood-fibrin, ceases to exist, when it is demonstrated that fibrin does not exist in it." Musculine is endowed with the vital property of contractility in connection with other immediate principles. Fresh muscular fibre is highly and indefinitely nourishing, but fibrin even mixed with soup is limitedly so. Roasted or broiled meat is more nutritious than boiled meat, as musculine is converted into a species of gelatine by boiling.

Osteine is the substance from which glutin, or gelatine is obtained by boiling. Glutin is an *exterior* product—it does not exist naturally in the body. Osteine is found in bone and in white fibrous tissue wherever placed. It is chemically combined with the phosphate of lime in the bones. It originates from the albuminous elements of the blood. Its chief use is of a physical nature, although it is nutritious and assimilable. Glutin, as proved by Majendie, is not nourishing. Osteine is not *formed* from cartilagine. For, as bone merely *replaces* cartilage, so the osteine replaces cartilageine. The latter exists in bone cartilage and in the permanent cartilages; but osteine coëxists with the first appearance of ossification.

Part II. embraces Histology with Histogeny, or the development of the elements just mentioned. Prof. Peaslee's work is what it professes to be—a treatise on Human Histology, both general and special—physiological and pathological. Thus the subjects it includes will be found to underlie the whole domain of anatomy, and of physiology, and pathology. Under the 1st Division is mentioned "Homogeneous substance." The classification of this substance as one of the histological elements is, we believe, peculiar to the author. It is described as a more or less solid, structureless substance, which enters into the composition of several of the tissues. It fills up the spaces between the fibres or cells of compound tissues. It exists pathologically in cancer, and is also an element in tubercle. It has two forms, viz: the hyaline and granular (as seen in cancer). Although probably developed from albumen, yet it is of a higher condition. In its lowest form, it is a mere cement for other histological elements. In bone, &c., its development is higher, though still of a low vital grade. Pathologically it undergoes fatty degeneration, and is subject to pigmentary deposits.

Simple membrane, or as it is sometimes called, *limitary* membrane, is a very thin, transparent, and structureless layer of coagulated albumen or plasma. It is non-vascular, and is never penetrated by any vessel, nerve, or other tissues, but acts as a barrier over or between surfaces. It is found in two conditions only, except when an element of compound tissues, viz: as basement membrane, and, as constituting the walls of cells. It possesses two vital functions, viz: absorption and secretion. It is also highly endosmotic. Basement membrane then, is a mere expansion of simple membrane, and is itself covered by the epithelium in serous and mucous membranes, and by the epidermis. In other words, it is the basis of the epidermis and of epithelium.

Simple fibre is next considered. It is merely the result of fibrillation. In solutions of continuity simple fibres become the *nidus* of repair, as well as the matrix in which the tissues generally are developed during embryonic life. It is therefore a temporary element, and not a permanent constituent of the body, unless as developed in some false membranes.

A most valuable chapter will be found under "Cytology." Tubercle falls under the division of "Pathological developments of Nuclei." The views are clearly stated, and they cannot fail to instruct. The uses of fat in the blood plasma from which cells are developed; the want of evidence as regards the existence of fibrin in the cell wall or

its contents, and the doctrine that the albumen of the blood, and not the fibrin, is the *pabulum* of the tissues,—are given in a concise and masterly summary. The theory of free cell development, and of cells from preëxisting cells, is fully entered into, and we would recommend to the student its careful re-reading, that their growth, nature, and function, should be impressed on the mind, in order to appreciate any deviation that may occur in them, as a pathological condition. The idea of running the healthy histology into pathological histology, is preëminently Prof. Peaslee's own. The science of life stands on the tripod of Histology, Physiology, and Organic Chemistry. Wanting a decent knowledge of these branches, the practitioner cannot claim to be any more than an empirical experimentalist. Although necessity caused empiricism to be the first leader into therapeutics, yet through the enlightened philosophy now accumulated, this necessity has ceased to exist, and medicine need no more wander with unsteady step and uncertain aim; but, like the unshackled captive, stride forth upright, with the consciousness of self-developed strength, and that its day of gloom and of doubt has yielded to a glorious sun.

A concise summary is given of "Cancer Cells." The microscopic illustrations are well executed, and will be found useful as guides to the inquirer. A discriminating view is taken on closing the subject, as to the value of the microscope in detecting cancer growths.

The second division embraces "The Fluids of the Human Body" (or "Hygrology") in their histological relations. 1. The blood, including lymph and chyle. 2. Serous secretions, transudations, and exudations. 3. Mucous and glandular secretions. 4. The cutaneous secretions. The "cytoid corpuscle" is first described, being one of the histological elements common to the lymph, chyle, mucus, pus, and to exudations and the colorless blood corpuscle. The generalization of the whole subject belongs to the author, although the term, we believe, was first used by Henle. The "cytoid corpuscles" are developed in any fluid containing their nutritive elements. Hence they are developed in exudations, and in the liquor muci, pus, &c. The author does not consider them as resulting from epithelial secretion of the mucous membrane. The function of the cytoid corpuscles in exudations is doubtless to constitute the basis of new tissue, *if sufficient local organic force exists;* but, as developed in mucus, or pus, they never advance towards organization.

Lymph (or also chyle) is to be regarded as the primary condition of blood, being elaborated by the proper glands, &c., till it is capable of assuming its full function in forming the liquor sanguinis. The

chapters on lymph, chyle, and the blood, are condensed views of their organic and chemical relations. The normal conditions of the blood are described in the most clear and concise manner, whilst the author's remarks on its pathological states in certain diseases are most valuable. The student will find the usually perplexing distinctions of the constituents of the blood explained in a most attractive and easy-to-be-remembered manner. The origin of the colorless and colored blood corpuscles is fully described. The elaboration of fibrin by the colorless corpuscles the author considers quite improbable, and supports his views by reference to the different conditions in which the number of white corpuscles is very great, yet the fibrin is found lessened. The portion devoted to the consideration of the gases contained (or developed) in the blood corpuscles is of high value; the deleterious action of certain carbo-hydrogens, carbonic oxide, &c., over the corpuscles, should be remembered, as it will be found useful by practical men. That the red corpuscles have any direct relation to the formation of the tissues, the author considers very improbable, and regards their special function to consist of dis-assimilation, with the consequent development of vital force, &c. If there be any particular organ for their formation, he adopts the view of the liver being the seat, while their dis-assimilation takes place in the spleen. The blood varies in different physiological conditions, viz: in pregnancy, in infant life and old age, and during digestion, &c. There are normal differences also in the different vessels. Every organ renders the blood more or less changed after its issue. In pathological states of the system, as before observed, the blood varies greatly.

The arrangement of the chapters on serous secretions, transudations and exudations, is most admirable, and of great simplicity, while their study makes the subsequent considerations on pus more intelligible, as respects its origin, characteristics, and its uses. Without a clear conception of these subjects, the study of inflammation must ever be a confusing subject, and a true knowledge of the histogenic realities of inflammation is the very basis of practical medicine.

The writer of this article has long looked upon the cytoid corpuscle as instancing free cell development. The nutritive elements, whenever placed in normal relation to their proper tissues of selection, have the capacity of developing (or being developed into) cells, whether in the lacteals, the lymphatics, or in *any other position having similar inherent vital action.* Wherever plasma or "blastema" is thrown out, cytoid formations ensue the same as though the elements

were under the influence of the lacteals, or lymphatics. From this view greater simplicity is afforded as regards pus generations, or other degenerated cytoid productions. It accounts for the independent or spontaneous generation of pus in parts suffering from local depravity, or having a low condition of organic force, which not being sufficient to *remodel the tissues*, the cytoid corpuscle could not advance to organization, but becomes effete, or changed from its vital use into a lower grade—or into pus. The character of pus is as various as the existence of the cytoid corpuscle—whether from lymph, colorless blood corpuscle, chyle, &c., &c., or from dissolution of the already formed tissues. Pus, therefore, is nothing more than a perverted or degenerated condition of the lymph, or chyle corpuscles—rendered unfit for normal organic employment from atmospheric exposure—disordered tissue assimilation, imperfection in the nutritive elements themselves, by which retrogressive acts take place, &c. Hence inflammation with pus exhibit is always deranged nutrition, and can never be termed "healthy," as its very birth is in unsoundness.

Mucus, as defined by the author, is "a fluid secreted by the epithelial cells and general surface of mucous membranes, except where they form the lining of minute gland ducts." He regards the mucous membrane, physiologically, as having no special function so far as it is *secretive*, but only so far as it is *protective*. The epithelial cells manifest the specific vital properties and secretory functions. The corpuscles he considers as not an *essential* part of mucus, nor as an abnormal production, as viewed by Kolliker. He believes them to be generated according to the law stated in the development of cytoid corpuscles. That they vary is undoubtedly true, but it is in proportion to the irritation or inflammation of the tissue, or of the blood itself. Mucus, however, is not protective only, as under certain modifications (as the gastric and intestinal fluids) it is essential as an aid to digestion.

Under the head of "Milk" will be found a valuable recipe for a substitute for mother's milk. Throughout the whole work the practical facts associated with the histology and pathology are clearly enunciated, and cannot but serve to induce a more philosophical and scientific regard, both from the surgical and medical practitioner, as regards treatment.

The chapter on urinary deposits and concretions is a most practical summary, while the illustrations will greatly aid the microscopic student.

In the chapter devoted to "Cutaneous Secretions" the author considers the main deleterious effect of "a check of perspiration" to be from the cessation of the exhalation of water, carbonic acid, and nitrogen, and not from the retention in the blood of the perspiratory elements. Hence the pulmonary, intestinal and urinary surfaces manifest greater transudation function than natural, after the arrest of the action of the skin.

The third division embraces the "Classification and Description of the Tissues." It has the merit of simplicity. The divisions of epithelium are peculiar to the author. The function of epithelium varies according to the variety and situation. The simple compound scaly being both for protection and secretion, elaborates serous or mucous fluids according to the structural position. The conoidal variety has the additional function of absorption, as seen in the epithelium of the villi. It is everywhere endosmotic. The ciliated variety of epithelium, existing in the air passages, in the female genital cavities, in the Eustachian tubes, &c., is probably endowed with a mechanical power of promoting currents, as it were, in the fluids, by which not only greater moisture is preserved, but a more extended exposure of surface is secured, especially in the fine bronchial tubes. In all cases secretion is apparently due to epithelial cells, and as they have normal functions, so are they liable to pathological changes. In some disorders they become desquamated, and sometimes so extensively as not only to rescind all local secretory action, but by their loss of protection to cause pathological conditions of irritability, inflammation, or other disturbances of nutrition. Hence we practically find that, by the too powerful or too frequent applications of escharotic remedies (as for example the nitrate of silver to the throat), the disintegration of the epithelium is effected, leaving the pharyngeal and probably the laryngeal surfaces bare, red, and glistening, the parts complaining, as before remarked, more of the *doctor than of the disease.*

Our limits will not permit an analysis of the chapter on "Yellow Elastic and White Fibrous Tissue." They should be carefully studied, from their vast distribution in the organism, and from their subjection to certain pathological states, either as hypertrophic or atrophic. From the fatality attending many of these morbid conditions, they might with reason be numbered amongst the malignant disorders—since "cirrhosis," granular kidney from hypertrophy of the inter-tubular collagenous tissues, &c., are as fatal in their results as regards life as any of the cancer growths.

"Areolar Tissue" forms the next subject. We will refer merely to its pathological conditions or developments. Increase of its natural serous fluid constitutes œdema, but if considerable, and in the subcutaneous areolar tissue, it is termed *anasarca* or dropsy. In areolitis an exudation results, which if extensive causes induration. This exudation may be converted into pus, with ulcerative action. In certain serous diseases the natural areolar fluid becomes absorbed, to compensate for losses elsewhere, hence the shrivelled appearance after Asiatic cholera. Ecchymosis is a mere extravasation of blood into the areolar tissue. Emphysema is a result of the introduction of air into this tissue. Sometimes it is caused by local decomposition. New abnormal formations of areolar tissue may constitute the stroma of cancerous growths.

Fat, and adipose tissue are not correlative terms. Fat is a fluid compound. Adipose tissue consists of cells and intercellar areolar tissue. In the nerves and brain fat enters into chemical composition with the tissues themselves. Excessive venereal indulgences and profuse suppuration cause emaciation, since semen, blood, and pus are rich in fat, and it should be remembered that all cells require fat for the development of their nucleoli. When wasted by any cause, it must necessarily interfere with the formation of bile, and other secretions. Therefore, its drainage from the system is directly injurious, not only from withdrawing the already matured fat, but by diminishing indirectly the supply of albumen, which is the *pabulum* of the tissues, and from which the fat itself is in part elaborated in the alimentary canal. Besides, its chemical relation in nerve and brain tissue is interfered with, and thus life is sapped, whilst premature decripitude with its marrowless bones totters in the footsteps of wasted youth-life.

The fact that in certain forms of phthisis, the administration of oils or fats are not only repugnant but injurious to the patient, may be well explained by the remarks on Stearosis.

The Osseous System is dealt with at some length by the author, and a more valuable chapter cannot be found in the book. To the surgeon the whole subject of the development, growth, and reparation of bone is replete with interest of practical importance. Indeed, without a histological knowledge of bone, the surgeon can only rank as a mere bone-setter, or sawyer, while its pathological states, or its new formations, can only be guessed at, or "lumped" under a very narrow vein. As the bones are the basis of the skeleton, so the knowledge of their histological elements—the mode of their

production and regeneration—is the platform of scientific anatomy and surgery.

Chapter 10th allots about fifty pages to the consideration of the "Nervous Tissues," and of the "Nervous System." Two forms of tissue are described, viz: the tubular or fibrous, and the vesicular. Tubular nerve tissue in its highest development encloses a fibre. The term "fibrous is used when the tube is wanting, as in the very minute forms. The length of the nerve-fibres vary according to the distance of the containing parts from the spinal cord, encephalon, or the terminating ganglia. The large nerve-fibres consist of a neurilemma, and its neurine (or the medulla and axis-fibre). The neurilemma consists of simple membrane with interior nuclei, but the finest fibres are apparently destitute of it. The axis-fibre occupies about one-third of its diameter, being an albuminous compound free from fat. The axis-fibre varies in size with the nerve-fibre, although during life it is undistinguishable from the surrounding medulla, which is itself a tube enclosing the axis-fibre. The medulla, unlike the axis-fibre, is chiefly a fatty compound. Some axis-fibres, however, are non-medullated, the finest being not only destitute of it, but also of a sheath. Histologically, the division into coarse and fine fibres is important, although physiologically it is not so, since the medullated coarse fibres sometimes lose these appearances and dwindle down into mere axis-fibres. There are no nerve-fibres peculiar to the sympathetic nerves, except that the proportion of the finer tubes is greater in them than in the cerebro-spinal nerves, which always contain certain dark-bordered tubes of all sizes, and especially at their distal terminations. The author agrees with Kolliker, in regarding the so-called gelatinous fibres of ganglionic nerves, merely "as a form of elastic tissue, or nuclear-fibres." These fibres, also, do not extend much beyond the ganglia in the main sympathetic trunk. In both systems of nerves, as well as in the white portion of the brain and spinal cord, the nerve-fibres constitute the chief part. The coarse fibres predominate in the muscles, whilst the reverse happens in the ganglionic nerves. The function of the coarse fibres is probably motor. The fine fibres are not motor, they are afferent, or conductors of sensations and impressions to the centres. "The finest fibres are not peculiar to the ganglionic nerves; and if they manifest a particular function (i. e. as the great sympathetic), that function is probably manifested by the spinal nerves also, in proportion to the fine fibres they contain."

We must now close, having already overstepped the limits allowed

to us. In doing so, we trust that sufficient subjects have been embraced to show the value of the work, the remaining portions being treated by the author in the same clear and nervous style. As a work for practical reference it is invaluable, and should find a place in the library of every medical student; we say student, as we have yet to learn when student-life ceases. H. P. D.

A Collection of Remarkable Cases in Surgery. By PAUL F. EVE, M.D., Professor of Surgery in the Medical Department of the University of Nashville. 8vo. pp. 858. J. B. Lippincott & Co., Philadelphia.

As its name indicates, this is a series of unusual cases, including accidents and surgical operations, arranged according to the different regions of the body to which they refer. Such a *melange* does not admit of review; and, collected as they are, from the MONTHLY and other medical journals throughout this and other countries, many of them are already familiar to our readers. One cannot but be amused by some of the contrasts the volume gives. There are cases of crow-bars shot through the head,—of lead bars taken from the stomach,—tumblers of glass and metal from the vagina and rectum,—of persons who have swallowed artificial teeth,—been struck by lightning,—of a man delivered of the fœtus of his brother,—of one who operated on himself for stone in the bladder,—of one who accidentally hung himself,—of a boy who vomited up a fœtus,—of traps to catch intestinal worms,—of amputation of the head, the patient living thirty-six hours,—and so on through whole lists of wonders. One feels after reading its list of contents, much as a child does after reading Foxe's Book of Martyrs, or some other similar book of horrors. The lesson to be derived from all these cases so far as they are surgical, is that the human body is capable of recovery after mutilations which we generally suppose must be fatal. And that even the most shocking accidents should receive the attention of the Surgeon, and careful thought and ready effort to save if possible life and limb.

Two things we much regret in the volume. One, that Prof. Eve did not confine himself to *surgical* cases entirely:—in which case the volume would have been more valuable and not so large, or have contained more information relating to that speciality. The non-surgical are not only found among the "miscellaneous cases," as one chapter is entitled, but abound in the other portions of the volume. As the

author says he labored under the *embarras de richesse*, there is less excuse for this mistake in a book of *surgical* cases.

The other is the manner in which the author treats questions of priority. We begin to doubt if it would be possible for mortal man to invent anything, in the way of medical science at any rate, without some one starting up and exclaiming that he had preceded him. We do not wonder therefore that disputes arise, but we do wonder that Prof. Eve, who has, if we mistake not, been annoyed by the same treatment, should have taken such a course as to annoy others. The first instance to which we refer is to Dr. Carnochan's claim to priority in removing the *entire* lower jaw. Against this Prof. Eve sets up Dr. Deaderick's claim to have removed *part* of it, in such a way as to leave (doubtless without intention) an impression that it was the whole. It would have been wise to be carefully distinct in such a matter. The other instance is in respect to Dr. Mott's claim to priority in removing the entire clavicle. The author claims this for Dr. McCreary, of Kentucky, on the authority of Dr. James H. Johnson, referring to a paper by that gentleman, but omits the insertion of the paper. Clearly it is impossible for more than a very few readers to hunt up that paper. With unusual facilities ourself we have not yet been able to do so, and it would have been only *fair* to have reprinted it, even if it would have compelled him to omit some account of "Accidental Hanging," or "Pins in the Stomach," or other case not strictly pertaining to surgery. Few will be inclined on this account to give the precedence to Dr. McCreary, while the author places himself in the position of a person desiring to snatch the laurels from the brow of one man, and yet failing to place them upon the head of another. It is impossible to rob Dr. Mott of the claim of *originality* in his operation, but every one must regret the tone which prevails in these remarks concerning him, based as they are on a harmless *jeu d'esprit*, occurring in a connection which fully justified it.

SELECTIONS.

The Licoperdon Giganteum. By B. D. Richardson, M.D.

One of your correspondents in your last Number asks some questions about the common puff-ball, or licoperdon giganteum. Perhaps the following facts may be of interest to him and others. The

licoperdon giganteum is classed by Balham amongst the edible fungi. In Italy it is fried with salt, and eaten as food. Mr. Butler, the herbalist in Covent Garden, has eaten it fried; and Mr. Smith, the stationer in Long Acre, esteems it a delicacy, and eats it regularly when in season. I have given it to dogs, mixed with animal food, without any untoward result. The fungus, like the roots of young fern, which the Thibetians eat with as much relish as we eat asparagus, and, like some sea-weeds, might be turned to great service as a food were its properties more widely known.

But the licoperdon is specially interesting to the medical man from the fact that when it is dried, and portions of it are burned, the smoke emitted contains a safe and admirable anæsthetic agent. For the purpose of stupefying bees puff-ball smoke has been used in some districts of England from time immemorial. Being aware of this curious fact in 1852, from my friend Mr. Hudson, I was struck with the analogy between the action of this fume and the vapor of chloroform. At once I extended this analogy, and administered puff-ball smoke to cats, dogs, and other animals, with great effect. I laid my results and experiments before the Medical Society of London, on May 31st, 1853. The summing-up of the paper read on that occasion, was as follows:—That there is a principle in the fumes of burning puff-ball capable of producing anæsthesia in animals. That this anæsthetic, in a liberal dose, narcotizes rapidly and effectually, without producing unpleasant symptoms. That, when carried to an extreme, the respiration always stops before the heart, and that so long as there is any respiration, the animal is safe. That the narcotic principle is highly volatile. The combustion of the fungus in oxygen does not destroy the anæsthetic principle. That the anæsthetic principle is neither absorbed nor destroyed by being driven through water, alcohol, or strong alkaline solutions.

Since the time when these results were drawn up, I have used the puff-ball smoke for various physiological experiments, to the exclusion of any other anæsthetic. At the least, I have narcotized a thousand animals with it, and without a single accident. For the physiologist there is no anæsthetic like it; it is cheap, its effects are intensely prolonged, and the danger seems as nothing, if care be used in the administration. In using it, my animals are placed in a box with glass top and sides; the smoke is introduced from a small furnace beneath. Drs. Thudichum, Macnab, and Halford, have all used the anæsthetic in physiology, and with the same satisfactory results. I have been narcotized myself with the clarified fumes, and felt none the worse for my pains. As yet, the application of this anæsthetic agent to man is impracticable in a great measure. The point is, to isolate the narcotic principle, and make out its nature, I have been constantly employed at this work, but without satisfactory results. Dr. Snow entered on this inquiry, and thought that some cyanogen compound was the narcotic: I repeated my excellent friend's experiments, but cannot confirm them. Mr. Thornton Herepath entered on this inquiry, and made out that the agent was carbonic oxide. I repeated Mr. Herepath's experiments, but cannot

confirm them; I could not detect carbonic oxide in the vapor. I found that combustion of the fungus in oxygen still produced the narcotic, and, compared by the effects of carbonic oxide on the same animal, the symptoms induced by the two agents are not, physiologically, the same. The narcotic of puff-ball smoke is, I believe, some hydro-carbon.

If a piece of the dried fungus be exposed to chlorine gas, the gas disappears, and the fungus afterwards burns more readily. The fumes emitted after this combustion produce narcotism, and the animal often recovers from the narcotism, but dies inevitably some little time afterwards,—dies simply protracted, without any manifestation of suffering. When the anæsthetic is produced by combustion of the fungus in common air, and its exhibition is very prolonged, the physiological effects are often most curious. The animal lies for a full hour entirely insensible to pain, but blowing in his breathing like a man in apoplexy. Slowly the consciousness comes about, long before the sensation. In this state, I have tied the femoral of a dog, while he has been licking the hand of an assistant,—perfectly conscious himself, but utterly insensible of pain.

Some time since, some Parisian experimentalists assumed to go over my experiments, and came to the conclusion that there was no anæsthetic principle at all in the fumes of the burning fungus. Their report was so loosely drawn up, and with such an obvious determination to find fault, that I never cared to answer it. But the fact seems pretty clear, in so far as one can judge from their wool-gatherings, that they had either not got for experiment the same fungus, or that they did not understand the use of the fungus when they had got it.

To show the absurdity of the French reporter's conclusion, experiment only is necessary; and I am ready at all times to show the anæsthetic fact, by experiment, to any one who may wish to see and believe.

The smoke of the licoperdon admits of some use in practical medicine. Smoked like tobacco in spasmodic chest complaints, it affords great temporary relief; and I have smoked it myself in toothache, with considerable, but not permanent benefit. I once also in a case of whitlow, saw great relief from pain follow on the placing of the finger for half an hour in a vessel filled with the vapor. Like chloroform, the anæsthetic principle of the fungus smoke extinguishes flame, suspends the oxidation of phosphorus, and acts as a temporary preservative of animal substances.

At this moment, I recommend this anæsthetic only for the purposes of the physiologist; but I think I have said enough to indicate that if more were known about it, it might be of equal use to the surgical practitioner.—*Medical Circular.*

Treatment of Anatomical Wounds with Lotions of Chlorine Water.

M. Nonat, Physician to the Hospital of La Charité, recommends the use of lotions, with solution of chlorine, in cases of anatomical

wounds, which unfortunately are far from being always exempt from danger. Be the wound large or small, be its surface united or anfractuous, the solution of chlorine destroys the putrid matter, which acts like a virus, and which causes so bad an influence on the system when absorbed. This agent may perhaps be absorbed, mix itself with the blood, and thereby prevent the mischief arising from them, or destroy those bad symptoms which have already appeared.

The way to use it is very simple. The wound is first well washed with water, then with the solution of chlorine. If the wound is one of some days' standing, if it is inflamed, if the lymphatic vessels and glands are obstructed, if the general appearance is favorable, and provided there are no symptoms of putrid infection,—the lotions of chlorine may arrest these accidents. It is useful in these cases, to use at the same time inhalations of chlorine.

M. Nonat has often had opportunities of testing these means, and in very serious cases. He thinks chlorine ought to be put at the disposal of the students, in the dissecting halls, and would have the following inscription upon the walls of the amphitheatre—"Wash, as soon as possible, your anatomical wounds with solution of chlorine." —*Union Medicale and Medical Circular.*

Parisian Hospital Practice. Complete Dislocation of the Inferior Maxillary Bone, Reduced on the 87th day. By M. NELATON'S Proceeding.

The following case shows, that in dislocations of long standing of the lower-jaw we must at first have recourse to the simplest means, and, if those do not succeed, use more severe ones afterwards.

This proceeding, which consists above all in pushing back the lower jaw, after having displaced it by a movement with the thumbs applied on the dental arches, offers the indisputable advantage of allowing the surgeon to feel or know exactly what takes place during the efforts at reduction, and to judge the degree of strength it is necessary to employ to overcome the resistance. If the resistance is too great, he can always have recourse to more energetic means.

A lady, sixty-four years of age, fell down in running, and received a large wound in the region of the left temple, and fainted. When she was raised up, she presented a frightful disfigurement of the face. But for eight days a serious cerebral accident attracted the whole attention of the Physician, and when she was better, wishing to take some food, she found it impossible to close her jaws. The doctor did not perceive the injury, therefore paid no attention to it. About three months afterwards, the patient finding that no change for the better was taking place entered the Maison de Santé, in the service of M. Demarquoy, who soon saw it was a complete dislocation of both the condyles of the lower maxillary bone. The chin was drawn downwards and forwards, the patient could no longer close her jaws, her pronunciation was constrained, and she labored under a disfigurement of the entire face. In putting his fingers into her mouth, the surgeon discovered that the coronoid apophyses were stopped by the

jugal bone. The first trial of reduction proved useless. The patient was then placed under the influence of chloroform, and the surgeon's second attempt was more successful. After a little cracking, and by means of strong pressure, the right condyle reëntered the glenoid cavity, but it started again as soon as the reduction was tried on the left side; in consequence of which the condyles were supported and the patient left quiet for four days. Nothing happened, and the dislocation did not again take place on the left side. At last, on the eighty-seventh day after the accident, the reduction was practised on the left side by the same proceeding, and the jaw was held up with a chin-cloth. The movement of opening and shutting her mouth was effected with facility, although the lower dental arch extends forwards beyond the upper one, which depends on the deformation of the glenoid cavities, the consequence of former dislocation. The patient left the Maison de Santé four days afterwards, being able to masticate without inconvenience.

This case is remarkable for the right dislocation being of such long standing, for the simple process by which the dislocation was reduced by M. Nélaton; and finally for the consecutive reduction of the condyles, which seemed to lessen considerably the force of the resistance.—*Medical Circular.*

Improved Method of Amputation of the Ankle-Joint. By Mr. Richard Quian.

"It appears to me, and, indeed, it has always appeared to me, that the chief advantage of the operation for removing the foot at the ankle-joint, is due to the fact, that the patient is enabled, in progression afterwards, to bear directly upon the stump. After any other amputation higher up—that, for instance, above the ankle, which, in other respects, is equally, if not more advantageous, the person cannot bear his weight upon the end of the stump. Ulceration of the integument would follow; while after an amputation at the ankle-joint, with a flap taken from beneath the heel—from structures, that is to say, which are organized for the purpose—with that covering the bones, pressure is sustained by the stump without injury.

"Now as to the plan of performing the operation:—When it was first suggested that the flap shoud be taken from under the surface of of the foot, instead of being taken from the front and sides of the joint, as previously practised, Mr. Syme, the author of the suggestion, advised that an incision should be made from one malleolus to the other, beneath the os calcis. But the dissecting back the concave flap, thus marked out from the projection of the heel, is a tedious process. One has to dissect in a confined space over the irregularities of the bone; and it has often happened that the integuments have been perforated behind the heel. Moreover, if you read the histories of cases fairly reported, in which the operation has been performed in that way, you will find that counter openings were subsequently required, to evacuate pus collected in the cup-like flap. It is in consequence of these evils that I was led to operate in the manner

you saw in these cases. Thus, after the incision from malleolus under the os calcis, I make a straight incision at right angles with the first, to the back part of the heel, on the outer side of the foot, a little above and parallel with its outer margin—between, therefore, the point of the outer malleolus and the margin of the foot. This plan facilitates the dissection from the os calsis, and hastens the operation. Independently of the direct advantage of this method of operating, I may remind you, by way of answer to possible objections, that the blood vessels (anterior tibial and posterior tibial), as well as the thicker soft structures, lie at the forepart and inner side of the ankle-joint, and beneath the foot. It is upon the careful preservation of these parts that the nutrition and the firmness of the stump depend. At the outer side, on the contrary, the os calcis is covered only with integuments, while the slender blood-vessel, the end of the peroneal artery, as it runs along the periosteum, is injured, probably made useless during the dissection. Hence the incision through this part, while it sets free the flap all around, and hinders the bagging of purulent matter, does not interfere with any important structure.

"It may be mentioned, too, that in the recorded cases of the amputation, as usually performed, the outer part of the flap, the part now in question, had often been mentioned as having sloughed. This fact is accounted for by the conformation just referred to."

As no mention is made in the foregoing observations of other parts of the operation, it perhaps should be stated that Mr. Quain makes the plantar part of the principal flap short, though long enough to cover fully the end of the tibia; and that he forms an anterior flap which, in the cases above related, met the larger one easily. He dwells on the advantage of so cutting the edges of the two flaps, by bevelling the parts beneath the integument, that they shall, in the dressing, meet skin to skin, as far as possible. This is done with a view to avoid the need for the formation of much new skin during the cicatrization.

I may likewise mention that, with the same view of facilitating the process, I have seen the operation performed with an incision directed obliquely backwards from the malleoli to the point of the heel. This plan, of course, removes the difficulty, by omitting the only difficult part of the operation; but the structures from the sole of the foot, "those organized for the purpose" of bearing the weight of the body in progression, are excluded from the flap. The importance of using the structures beneath the heel was enforced by Mr. Quain some years ago, in a "Clinical Lecture on the Places of Election for Amputations of the Lower Limb," published in the *Medical Times*, vol. iii. (new series), page 659, and referred to in his recent clinical lecture. In laying down general principles applicable to the amputations of that limb, he there says:—"That in no case where the operation is made through the leg or the thigh, can the person afterwards rest easily the end of the stump upon the artificial support. It is only where a part of the sole of the foot is made to cover the bone, that the end of the truncated limb will sustain, without pain or injury, the weight of the body. In other words, it is only the struc-

tures which are organized for the purpose, that will sustain the pressure, in these circumstances, without causing pain or suffering ulceration." And again, in the same lecture, these words occur :—"I may state that even when this modification in the method of performing the amputation was first made known, I took occasion to perform it, and I then advocated the plan on the same grounds that I now offer in recommendation of it." The date of the publication from which these extracts are taken, is 1851. I shall only add that the operations which I saw performed, without including in the investment of the bone the strictures here adverted to, did not seem to promise a very satisfactory result.—*Medical Times and Gazette.*

Interesting Case of Transfusion of Blood.

This operation was successfully performed on the 16th of September, by Mr. Wheatcroft, surgeon, of Cannock, Staffordshire, England, on the person of a woman named Wood, residing there. Immediately after her accouchement fearful hæmorrhage set in, draining the woman of blood. She felt herself dying, and summoned her husband to her bedside, bid him "good bye," and earnestly requested him to take care of the children when she was no more. She then became pulseless and gasping, occasional breathing being the only indication of life. A vein was opened in her arm, and one in the arm of her husband, and as the blood flowed from the latter, it was transmittted, by suitable apparatus, into the veins of the wife. After seventeen ounces had been thus injected, the pulse became perceptible, the colorless lips reddened, the glassy eyes brightened, and she thankfully said, "I am better." The case has progressed very favorably, and the woman is recovering.—*Medical Circular.*

Cod-Liver Oil Solidified with Gelatine.

Take of pure gelatine, half an ounce ; water, simple syrup, of each four ounces ; cod-liver oil, eight ounces ; aromatic essence, as much as may be sufficient. Dissolve the gelatine in the boiling water, and add successively the syrup, the oil, and the aromatic essence ; place the vessel containing the entire in a bath of cold water ; whip the jelly for five minutes at most, and then pour it, while still fluid, into a wide-mouthed glass bottle, furnished with a cork, or with a pewter cup, or if a bottle be not at hand, into a porcelain or earthenware pot, which should be carefully closed.—*Bul. Gen. de Thérap.*

Lichen and Cod-Liver Oil.

Take of Iceland moss jelly, four ounces ; gelatine, four scruples ; hydrocyanated cod-liver oil (to which two drops of essence of bitter almonds have been added), six drachms. Prepare the Iceland moss jelly in the usual manner ; melt the gelatine and pass it into the vessel which is to hold it ; then add the cod-liver oil ; stir the entire with a spatula, until the mixture be homogeneous and the jelly begins to congeal. Dose—two or three spoonfuls daily.—*Bulletin Général de Thérapeutique and Dublin Hospital Gazette.*

EDITORIAL AND MISCELLANEOUS.

—Several journals have been copying what has been said by one or another in opposition to our position with reference to Dr. Uhl. Happening to have more complete information than they upon the facts in the case, our judgment is quite as likely to be correct. This will probably be apparent after the trial of Mrs. Cunningham. Our position was taken not because we supposed it would be popular, but because it was the true one.

—No doubt it is an honor for us to have our articles attributed and credited to other sources, but we will willingly forego this for the sake of having the MONTHLY receive its proper acknowledgment for what appears in its pages. The last number of the *Charleston Journal* credits a part of one of our articles on vaccine virus to the *Dublin Press;* the *Philadelphia Journal* last Summer took one or two whole articles of Dr. Green's prescriptions and published them as original, and they were so credited by others; the *St. Louis Journal* copied two or three things in the same way, among others Dr. Noyes' article on Eunuchs, &c., in the East, for which we had paid a pretty good price to the author. Others either take our extracts from European journals without credit, or else have a wonderful knack at writing just the same words as introductions to them, and omitting the same parts that we do. Our intimate relations with Europe enable us to obtain the journals at an earlier day than others, and we have no objection to other journals quoting; but fair play is a jewel in honorable rivalry, and a thing that is worth quoting is worth crediting.

—The anniversary oration before the Academy of Medicine was delivered on the 18th of November by Dr. J. Marion Sims, in the new and beautiful hall of the Historical Society. His subject was the use of silver for sutures, including, of necessity, an account of his progress and experience in the treatment of vesico-vaginal fistula. Dr. Sims gave it as his opinion, that his invention of the use of silver instead of silk for the purposes of suture, would in due time revolutionize surgery and be confessed by all to be the great discovery of the nineteenth century. At its close highly complimentary remarks were made by Dr. Francis concerning both the paper and the speaker, and it was unanimously voted that it be published by the Academy.

—At the November meeting of the Academy of Medicine, an

interesting report from the section on materia medica and therapeutics was read by Dr. E. H. Janes, the Secretary of the section. The subject was that of condensed milk, as prepared by Mr. Gail Borden. After a brief but learned statement of the ingredients of milk, its composition, and the difficulties in the way of obtaining it in cities in a proper degree of purity, together with the results of such changes and adulterations, the report proceeds:

It affords the Section no small degree of satisfaction to be able to state to the Academy that, after a thorough examination of this subject, they are fully convinced that in "Borden's condensed milk" the citizens of New York may be furnished with an article that for purity, durability, and economy, is hitherto unequalled in the annals of the milk trade. The facilities that he enjoys, both in a pecuniary and scientific point of view, added to the high character he sustains as an honest, upright man, not only afford him no inducement for deception, but on the contrary, should be sufficient to inspire all with implicit confidence in the truth of his statements, and insure the final success of his undertaking.

In order to carry out his views to the greatest advantage both to himself and patrons, he has selected for the seat of his operations a section of country abounding in rich pastures and healthy cattle, and so remote from the city as to enable him to procure milk from the neighboring farmers at a much cheaper rate than is usually paid by the milk dealers. As soon as received, it is with as little delay as possible deprived of a greater part of its watery portion, leaving the nutritious portion wholly unaffected, and in a portable condition. In the examination of the merits of this article, the Section have thought proper to acquaint themselves, as far as possible, with the mode of its preparation, to test its value as an article of diet, its therapeutic virtues, its purity, its durability, and economy.

In order to become more thoroughly satisfied concerning the manner in which the milk is prepared, it was thought advisable that the whole process be submitted to the careful inspection of some member of the Section. Accordingly, the Secretary, accompanied by Dr. Griscom (who has kindly volunteered his assistance in the investigation of this most interesting subject), at their earliest convenience visited the laboratory of Messrs. Borden & Co., and were enabled to witness the process through its different stages, from the milking of the cows to its final completion. The milk, immediately after leaving the cow, was strained into an ordinary milk can, then placed in a cold water bath, and there it remained until it was entirely deprived of its animal heat. It was then placed in a hot bath, and soon as possible raised to a temperature of about 175° Fahrenheit. This caused a slight deposit of a viscid albuminous matter upon the sides of the can, which, if allowed to take place in the evaporating pan, greatly retards the process of evaporation. The milk is now passed through a second strainer, and without delay removed to a vacuum pan, where the water is evaporated. This pan consists of a large

metallic vessel, supplied with a jacket for the reception of steam, by means of which the heat is applied. Connected with the pan, by a tube, is a barometer that indicates at a glance the extent of vacuum, and by another tube, which serves also for the escape and condensation of steam, an air pump in constant motion. A thermometer, also in direct communication with the interior of the pan, indicates the temperature, and by means of a glass light in either side of the pan, we can from time to time witness the progress of the evaporation. While witnessing the process, every few minutes a note was made of the temperature, extent of vacuum, and other points of interest. For instance, at 9 o'clock there were 247 quarts in the pan, boiling at a temperature of 118° in a vacuum of 27½ inches. At forty minutes past 9, 180 quarts were added; at thirty-five minutes past 10, 240 quarts were added, making in all 667 quarts, which by thirty-five minutes past 1 o'clock was evaporated to one-fourth the quantity. During this time the temperature was twice observed to be above 130°, but most of the time it was from 115° to 126°. An opportunity was also afforded to test the relative quality of milk from the respective farms. Thus, from five different farms the milk was examined by the lactometer, and showed that the morning's milk was of a richer quality than the evening's. The cows taking little or no exercise during the night, less fat is required to support the respiration, and consequently more allowed to pass into the milk. The milk from one farm, where the cows were thin in flesh and seemed destitute of fat, was superior to the milk of cows that presented to the eye a more attractive figure. It is a fact familiar to every medical man, that those mothers who are of a slender frame, small muscular development, and deficient in adipose tissue, often afford better nourishment for their offspring than many mothers of a full and plethoric habit. In the one case the fat and casein supplied by the food passes into the milk; in the other, more of the one is deposited and retained in the areolar tissue, and the other contributes to the support and development of the muscular system. During the preparation of this milk, your committee beheld nothing that was not to their minds eminently satisfactory, both in the frankness with which everything pertaining to the subject was submitted to our examination, and the intelligence manifested in the replies to our many inquiries.

In reference to the condensed milk as an article of diet, its importance is at once established by the fact that it retains all of the nutritive qualities of milk uninjured. Cheese made from it is superior to common cheese, as it contains not only the casein and butter (the beef and fat), but the sugar also, which, as before stated, supplies the starchy matter of vegetable food. In the ordinary method of cheese-making, the sugar is lost in the whey, thus depriving us of a very important element of nutrition. Used in its condensed form, this milk imparts a delicious flavor to coffee, fully equal to that of thick cream, and in short, as far as could be ascertained upon the most rigid inquiry, it has, whenever used in the various departments of the culinary art, given entire satisfaction. Its therapeutic value is restricted to that of pure milk and cream, and wherever these are

indicated the condensed milk is equally valuable. It has been suggested as a substitute for cod liver oil, and in those cases in which the oil is not tolerated by the stomach, and cream has fulfilled the indications presented, the same amount of benefit may be derived from its employment; but as its amount of carbonaceous matter is so much less in proportion to its volume than exists in the oil, the Section are not prepared to say that it can in all cases be substituted for that remedy. The opinion prevails to a considerable extent, that boiled milk has a strong tendency to constipate the bowels, and that question has been raised in reference to the condensed milk. To a note addressed to Prof. Henry G. Cox, Physician to the Nursery Hospital, where the milk has been used for the last two months, that gentleman replies that it has no such tendency. He is pleased with it as an article of diet for children, in the absence of pure new milk, and he adds, "if Mr. Borden continues to furnish it unadulterated, I think it will be a great improvement to the public over the manufactured milk now so generally in use."

In order to test its purity, it has been submitted to careful microscopical examinations as well as different chemical tests, and found to contain nothing but pure milk. In this connection it might be well to add, that when allowed to stand for some time, small crystals are deposited upon the bottom of the can, which has given rise to the remark, that some foreign substance had been added to the milk. These crystals are nothing but the sugar of milk, and so far from being an objection, they afford proof that the milk has undergone no decomposition. They are readily dissolved upon the addition of water. Its durability depends in a great measure upon the manner in which it is kept. When exposed to the influence of hot, damp weather, it will remain sweet but little longer than ordinary milk. If kept upon ice, or in cold weather, it will remain sweet for many weeks. When hermetically sealed, it will keep for many months, or even years. In answer to inquiries on this part of the subject, the following communications were received:

Office of N. Y. and Liverpool U. S. M. Steamers,
October 29, 1857.

Dr. E. H. JANES, Sec'y of Med. Com.:

Dear Sir,—In answer to your inquiries relative to Borden's Condensed Milk, I have to state that it has been used on board of this line of steamers for several voyages, and ascertaining that it would keep to Europe and back, it is put on board for the return voyage, and found good on return of ship to this port.

G. BRIGGS, Supt. of Collins' Steamships.

Steamship Augusta, Oct. 29, 1857.

Dr. E. H. JANES, Sec'y of Med. Com.:

Dear Sir,—In answer to your inquiries in relation to Borden's Concentrated Milk, I beg leave to state that the steamer *Augusta* has used it exclusively for the last two or three months on her passage to and from Savannah, Georgia, with convenience to the ship

and comfort of the passengers. I also learn that the steamer *Alabama*, sailing to the same port, exclusively uses the milk.

Respectfully, DAVID SIMMONS,
Chief Steward Steamer Augusta.

A communication was also received from Hutchinson & Co., ice dealers, stating that they had furnished steamships with this milk, and in no instance had heard any complaint of its becoming sour. Full directions are given by the proprietor on this subject, and those who follow out faithfully these directions, will find it quite as durable as is represented. Its economy is entirely in the hands of the consumer. It is sold in its condensed form at 32 cents per quart. Add three quarts of water, and we have four quarts of pure cows' milk. Add another quart of water, and we have five quarts of better milk than is usually supplied at our doors. Should any one desire a still cheaper article, he can learn how to obtain it, by referring to an account of a recent meeting of milkmen, given in the *New York Daily Times* of Monday, Nov. 2d.

In conclusion, the Section beg leave to assure the Academy that they believe Borden's Condensed Milk to be what it purports to be, and nothing more, viz: pure milk deprived of most of its water, and deficient in none of its nutritive elements. They believe it to be the best possible substitute for pure new milk that can be had in this or any other city. Equally adapted to the wants of all conditions of life, and often a valuable auxiliary to the physician, either in private or hospital practice. And as such, the Section would earnestly recommend it to the favorable notice of the Academy.

JOEL FOSTER, M.D., Chairman.
E. H. JANES, M.D., Secretary.

This milk has been examined by us with some care, and it is certainly a great luxury to those who are obliged to use what is rather quaintly called "milkman's milk." In coffee it is as good as the best cream, and when frozen without eggs, it makes the most delicious ice cream. With children we have used it, though but little. They appear to be very fond of it, and to digest it readily. So long as its preparation is in the hands of such men as Mr. Borden, its purity and excellence can be depended upon. It may be of interest to add, that he informed us that the difference in the charge of the railroads for freight between this and the uncondensed milk, would pay for the expense of manufacture.

Chloroform Liniment in Burns.—M. Bargiacchi states that he has found the extreme suffering produced in bad burns completely relieved by means of a liniment composed of chloroform and cod liver oil.—*Bull. de Thérap., June, p. 516, and Med. Times and Gaz.*